

# Computer Weekly

Thursday, February 19, 1981

## NEWS BRIEF

### New route for IBM

MAKING use of some of the expertise built up from its expensive and not very successful System R relational database project, IBM has added an easy-to-use relational facility to its existing DL/I database system. Called Structured Query Language/Data System, it is aimed at DOS/VSE users.

IBM's bow – albeit a cautious one – towards the relational database philosophy is a significant change in direction, since its major database investment is represented by IMS, which is not geared to the relational approach.

### Second chip

INMOS, the sole UK venture into standard microelectronic chip manufacture, announced details of its 64K dynamic random access memory at the International Solid State Circuits Conference held this week in New York. This is the second chip to be developed – the first was a 16K static RAM.

### Turnkey services

TURNKEY services for first time users are now available from a new company set up by four ex-Burroughs staff. Called Cardinal Computer Services, it is based in West London and has installed its own Burroughs B80.

### Micro networks

NETWORKING with PCs or Apples is faster and cheaper than using large timesharing systems like the IBM 370, according to Dr Michael Bodner, president of networking company Synergos Inc, speaking at the Communications Networks '81 conference held in the US last month. The problem is that too many users do not take microcomputers seriously enough, he said, and regard them as toys.

### Olivetti at the double!

IF sex alone held you back from the Avon International Women's Marathon, run through the streets of London last year, you have no excuse for not entering the first London Marathon, organised by Gillette in association with the GLC and AAA for March 29.

Olivetti is providing computing services to work out the time of each runner and prevent anyone from cheating by joining the race part way through.

Every runner will have a bar code on his number bib which will be read before the start and again after crossing the finishing line.

Times will be recorded electronically in the computer as each person crosses the line and a funneling system will ensure that they are read in the same order.

The first 100 runners will be given printouts of their times, and the others will receive theirs through the post later.

Five Olivetti P6066 desk-top minis will be doing the work, using largely new software which is currently being written in some haste, and light pens from SB Electronics.

Silvana Cruciale, winner of the Avon Marathon.

### ICFC cash for bureau

by Kevin Cahill

THE bureau and software house Computer Resources has received an injection of £150,000 of equity capital from TDC, the high technology investment arm of the Industrial and Commercial Finance Corporation, ICFC.

"The reason for going to TDC," says Ian Ocock, managing director of Computer Resources, "is to take advantage of the long-term



### Row on sale of company 'on the cheap'

by Kevin Cahill

A ROW has broken out over the purchase by two directors of Maindeck, the DEC maintenance company, of the 80% stake in the company held by Computer Trading.

A rival bidder, Nick Brackenbury of Dartcrest Ltd, alleges that he was not notified of his removal from the board, nor was he told of the Timms/White offer.

He says he will take further action in relation to his interests as a shareholder in Computer Trading and his liabilities as a guarantor.

Contentious between Brackenbury and Waldie dates back to November last year when Globe Computers, a wholly owned subsidiary of Computer Trading, went into liquidation. Brackenbury claims to have lost £4,000, and both Waldie and Brackenbury at the time indicated they were considering taking legal action against each other. So far neither has done so.

Since going independent, Maindeck has launched a recruiting campaign and intends to open a London office. Its turnover, according to Timms, is around £250,000.

To be relatively non-controversial, Cook would limit his bill of government files, excluding its private sector, and would even police and security records. Let the law be extended.

On the future of data protection legislation as a whole, the government is now saying it "hopes to make a statement this session". Cook feels that anything the government came up with in response to the Council of Europe's convention would be very unlikely to come up to the standards it is seeking in terms of rights of subject access. Therefore, he believes, a government bill and its own could stand side by side.

The company will shortly announce turnover of £3.25 million and gross profits of over £250,000 for last year. It employs 200 people and after the injection is owned 75% by Ocock and 25% by TDC.

### EEC aid set for Britain

• Front page confidence and the other 13 winners are not expected to publish their projects.

A total of £9 million is allocated to this section, mostly as loans, while the remaining £6 million goes mostly in grants to projects specified by the EEC under seven categories: Standardisation, R & D, public procurement, medium term financial instruments, industrial and social, confidentiality and security, and software copyright protection.

A requirement for all the awards is that more than one company from more than one country must work together on the projects.

The study of methods and impact

techniques of systems analysis and programming is to be carried out jointly by the National Computing Centre and Gesellschaft für Mathematics und Datenverarbeitung in West Germany. It will cover specification and validation of software systems, comparison of alternative methods and training, in a project valued at £1.16 million.

The privacy and security study is to be carried out by NCC and GMDD, working with the French Plastimatiq. This is set up by the French Industry Ministry at the beginning of last year, valued at £535,000; this study includes implementation of legislation, feasibility, financial implications and impact.

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# Was your computer designed for you, or for thousands of Americans?

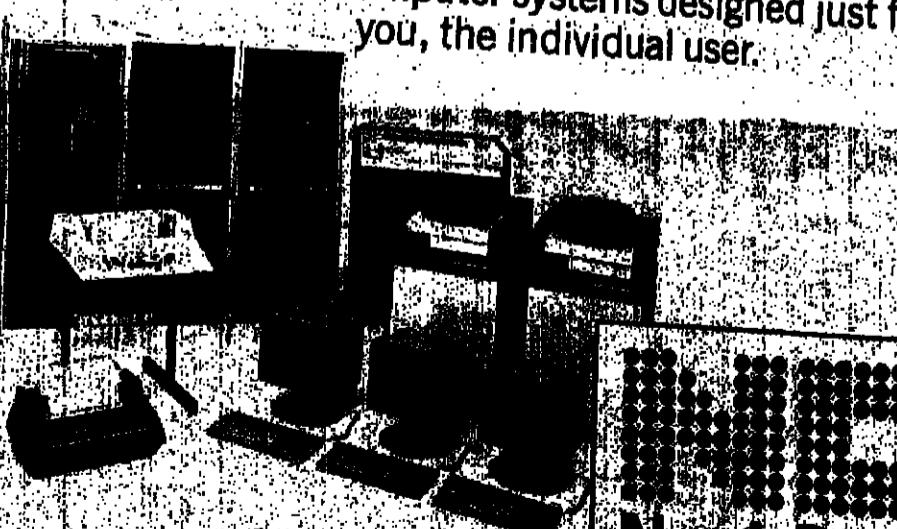
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## Honeywell puts the accent on security

by Keith Jones  
**INCREASED** security is the main feature of a group of new systems software products announced by Honeywell for its Level 64/DPS medium-scale mainframe line. New hardware features include an increase in main memory size from two to four megabytes and a 1200-megabyte per spindle drive, the MSU 0555.

There is also a new package of software aids called Transit for translating files and programs of IBM, ICL, NCR, Burroughs and Univac systems into 64/DPS files.

This latest group of enhancements for Level 64 follows closely

on the launch of the Datancet 8 network processor which handles all data communications on behalf of a 64/DPS host and forms part of the Honeywell Distributed Systems Architecture which was formally unveiled last October.

One of the new systems software products, Systems Access Rights, is an optional extension to the GCOS operating system which allows the owner of a file to define various levels of access rights to other users. Another, General Access Control, allows protected access to the same file simultaneously from batch jobs, transaction jobs and interactive users.

Honeywell says that it automatically resolves conflicts which may arise when two or more users attempt to update the same record or page of a file.

A third new product, Interactive Resource Monitor, is designed to increase the amount of interactive work that can be processed using the same memory resources.

Also new is System Behaviour Reporter which monitors and analyses the usage of Level 64 systems resources and records all information in graphical form.

Level 64 machines are manufactured in France by CII-Honeywell Bull at Anger.

## Olivetti new chief

**Olivetti Computers**, one of the three firms in Europe selling IBM compatible versions of Hitachi's large scale mainframes (see front page) has a new man in the managing director's seat at its Rome headquarters. He is Mario Pedretti, formerly director of marketing with the parent company and a one-time country sales manager for IBM Italy.

Pedretti replaces Lorenzo Bozzi who is being retained by Olivetti Computers as a consultant, primarily to advise on how the company should handle its dealings with Hitachi in Japan.

Hitachi is known to be embarrassed by having three separate firms selling its big-machines in Europe.

Olivetti Computers has not sold the sales success with the Hitachi built machines that it originally hoped for.

## Legal technicality clears CSC

THE US government has lost the latest and possibly final round of its legal action against Computer Sciences Corp, CSC, in which it is charging the giant computer services firm and six of its employees with deliberately overcharging for its infonet time sharing facilities.

In the US District Court at Alexandria, Virginia, Judge Richard Williams dismissed all charges against the company and five of the individual defendants on the basis that unauthorised people were present at the hearings of the Federal grand jury that brought the indictment.

Charged against a sixth defendant were dropped because the government failed to inform him that he was under investigation when he appeared before the grand jury. In this way his constitutional rights were violated.

The charges against Computer Sciences were first levelled in October last year and led to a ban on the company bidding for any new government contracts, a serious blow because government work provides the firm with the majority of its revenues. Early this year the ban was lifted on bids for all new contracts except time sharing.

While existing Infonet business with the government brings in a substantial \$40 million or more, it is quite modest in comparison with Computer Sciences' contract work for US government departments which brought in a formidable \$243 million in the year ended March 28, 1980.

You have every reason in the world to switch to NEC's "thimble" printers.  
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The Wangwriter comes to the UK

## UK launch of Wang entry in low-cost word processor war

by Rory Johnston

WANG's entry in the low-cost word processor war, the Wangwriter, has now been launched in the UK, with deliveries to the Massachusetts supplier's existing large customers starting in June. A special sales organisation is to be set up by Wang in the summer to deal with small, first-time users, of whom the company estimates there are 5 million worldwide and only 5% currently have word processors.

The General Business Systems organisation, as it will be called, will also sell minicomputers.

Whilst first-time users are an important future business, for the moment 60% of Wangwriter sales are expected to go to small departments and branches of large firms.

The Wangwriter, costing £4,550, is a stand-alone screen word processor with for the time being only a single mini-floppy disc drive. Thus the taking of security copies has to be done one document at a time, a cumbersome

process. A new relatively slow design of daisy wheel printer is included in the price, with the unusual feature of ejecting the paper underneath.

Wang is following IBM's lead in minimising the training and support provided for a machine that it sees very much on a "plug it in and use it" basis. Purchasers are provided with self-teaching programs and diagnostic discs to help trace hardware faults. Most support is expected to be done by telephone.

Operating procedure is similar to Wang's existing ranges of word processors but in a departure from the company's policy hitherto the machine is not directly compatible. Thus transferring documents from the Wangwriter to an OIS word processing system requires attachment of a special "Minidiskette Workstation" to the OIS, since the latter does not use these discs. The workstation, with its screen, keyboard and disc drive can also be used for editing.

### Hitachi responds to 3081

● From front page

Other key features of the air-cooled M280H include a main memory expandable up to 32 megabytes and up to 32 channels.

No announcement has been

made yet about the marketing of

the M280H in the West by any of

the three firms that already sell

IBM compatible versions of the

M160 and M200H — National Advanced Systems, BASF and Olivetti.

Much further down the performance scale, Hitachi has introduced a second machine, the M240H, which is said to offer up to four times the performance of the M160H. The latter computer, which has been around for several years, roughly matches the now obsolete IBM 370/145.

An IBM 3680 compatible version of the M200H in Britain, has yet to announce a dual processor.

per spindle disc drive, the 8598,

is likely to be available in the West

from at least one of the firms that

sells its big processors. National

Advanced Systems is likely to sell

the drive and BASF also hopes to

offer it.

Last year BASF announced that

it intended to sell the AP and MP

versions of the M200H as the

7/80AP and 7/80MP. Earlier this

month NAS announced its own

IBM compatible version of the

M200H, as the

AS/3000 DPC, for delivery at the

end of 1981. It will come in both

tightly and loosely coupled ver-

sions along with NAS-added fea-

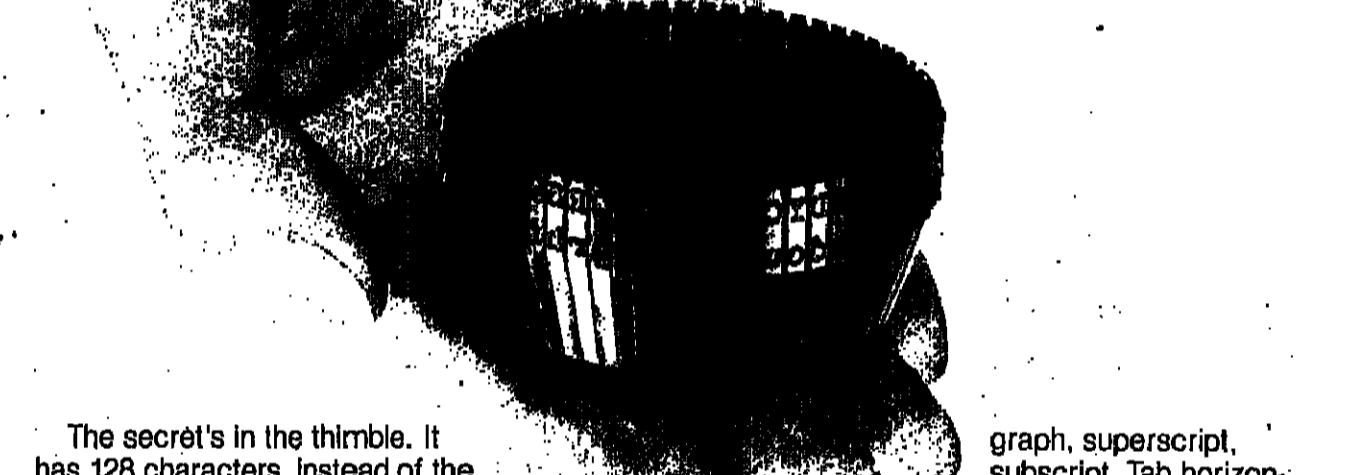
tures like extended channels and

fast memory, data streaming sup-

port and MVSSP. Olivetti, the third

vendor of the M200H in Britain, has yet

to announce a dual processor.

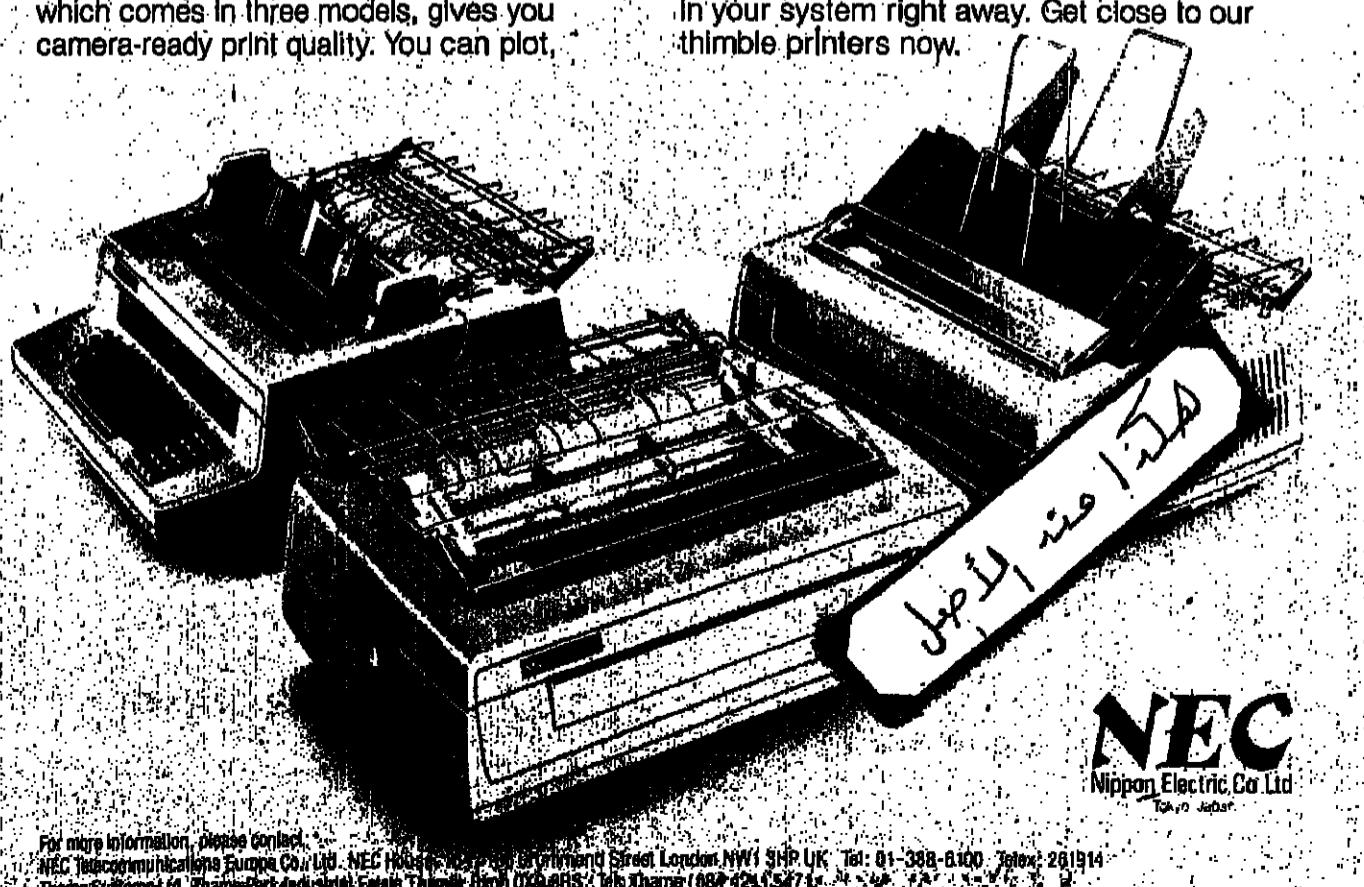


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# Western Europe services market 'will catch up with the US by 1983' – report

by Keith Jones

The Western European market for computer services will be as big as that in the US by 1983. This is one of the main conclusions in the fourth annual European market survey\* published by the European Computing Services Association.

Prepared for ECSCA by the London office of Quantum Science Corp, it gives \$7.1 million as the total 1979 user expenditure on computing services in Western Europe, and an overall growth rate prediction of nearly 16% for 1979-1984. Batch services, which now account for more than 38% of all business, will grow by a relatively sluggish 8.9% a year but remote services will zoom ahead with an 18% growth rate.

Software development services will enjoy an average annual growth of 18.1% while sales of software products, no doubt encouraged by the desperate shortage of programmers for custom software development, will lead the field with an 18.9% growth.

Breaking down the market by

supplier, the survey reveals that IBM is still the largest services supplier in Europe.

French computer services companies account for 13 out of the 30 top suppliers of services in Europe and occupy five of the top ten positions. Only four UK firms make the top 30, and only five US-based companies. The survey explains that US suppliers dominate particular market sectors like time-sharing services and system software products.

Competition from small business systems suppliers is identified by the study as one of the main problems experienced by services suppliers and it sees major growth opportunities for all services suppliers in the integration of hardware and software systems.

The expenditure on hardware for resale as part of complete systems was found to total \$600 million at end user prices in 1980.

Total employment in the European services industry was 161,000 with France accounting for 34,500 and the UK 34,000. Employment in West Germany

was only 18,100.

The Fourth Annual Survey of the Computing Services Industry in Europe 1980, Price to contributing members of ECSCA, £43. To other ECSCA members, £65. To members of other computing services associations, £130. Quantum Science Corp, 16 Charles II Street, London SW1Y 4QU. Tel: 01-839 5347.

## Japan eases restrictions

JAPANESE business for US computer services firms, in particular time sharing suppliers like Control Data, General Electric and Tymshare, should benefit from an easing of Japan's restrictions on the sale of US originated services.

Until now US firms have only been able to offer trans-Pacific services from one site in the US, restraining them to offering only about 10% of all the facilities they could make available. That limitation has now been removed.

Clovis Sinclair with his pocket TV.

## London Polys order 200 VDUs from Data Type

AT least one firm in depression-hit South Wales is doing well. Data Polytechnic, North London Polytechnic, the Polytechnic of the South Bank and the Polytechnic of Central London, each runs a Digital Equipment DECSYSTEM 10 mainframe, Central London also being served by a DEC VAX-11/780.

The Data Type DT2 provides a 12 x 10 dot matrix character resolution and its keyboard includes a numeric pad. The DT2 also offers 11 special function keys which can be preset to increase flexibility.

The four Polys are City

## Pocket TV for £50 by 1982

by Brandon Gamester  
CLIVE SINCLAIR (left) holds up the tube for his £50 miniature flat-screen TV. By the end of 1982, a new factory in Dundee will be opened to produce 1,000,000 sets a year. Production is planned to be increased through to 1985 when 1,000 people will be employed on the project.

TONY RUND, general manager of Sinclair Research, told Computer Weekly that the TV should open out a completely new market in the same way as did the radio when it changed from being a household asset to a personal one when it became transistorised.

The £1 million-plus invested in R&D to perfect the design of the cathode ray tube and the techniques for automating its production were shared between Sinclair Research and the National Research and Development Council. Sinclair's portion has been raised largely from profits on its ZX81 £100 microcomputer which was launched 12 months ago and is currently being produced at a rate of 10,000 units a month, 70% of which are being exported.

THE debate goes on, in these columns and elsewhere, over whether computers can really create anything new.

The issue is particularly contentious in the field of art, where computers are being programmed to produce pictures, pieces of music, even books.

AS THE little computer-controlled cart trundles round the floor drawing squiggy lines with a felt pen, the onlookers argue endlessly over whether the resultant pattern is the creation of the programmer (in which case the computer did not produce anything) or is random (in which case it is not art) or is something else again.



DAVID BM: Fascinated by the nature of electronic light.

can be one of trial and error, because an area filled in with one colour or texture can easily be changed to another automatically.

The finished pictures are best viewed on the video screen, which gives brilliant, almost vibrating images. Em describes himself as "fascinated by the nature of electronic light." For wider dissemination, though, he is making 30-inch by 40-inch colour photographic prints, and hopes soon to be able to make them 10 feet long. He has also produced lithographs from the pictures.

The visions in Em's paintings can only be described as fantastic; he says himself, "They are imagery that could not exist in reality." People often tell him that the pictures remind them of things they have seen in their dreams. They tend to be curious mixtures of purely abstract and vaguely natural forms. Architectural features, valleys, rudimentary landscapes seem to be visible in many of the pictures, as Em himself points out. He remarks that, curiously, "It is forms found in Nature that the computer likes to deal with on its own most of all."

This raises the intriguing question of what it is that the computer is actually doing for the artist. Says Em, "It leads me to trains of thought that would never occur to me without the computer." Pardon, he explains, the medium does tell him what to do, and it is possible for him not to know at the beginning where he will end up with a picture. But this was true of classical painters too, he points out.

The one thing of which Em is sure is that he could never exhaust the possibilities of his new medium. "I feel I have an infinite machine here," he says. His job is to work with the machine to seek and find new visions, new relationships between colours, new spaces. "The medium is only at the Neanderthal stage," he asserts.

What need has a space research centre for a fine artist, ask we matter-of-fact Britons? Very little; but even the most down-to-earth American institutions tend to have a little voice in the back of their minds saying "We ought to do something about Culture and the Quality of Life."

The significance of JPL is that it is the place where pictures transmitted back from space probes to Saturn and beyond are received and processed, and for this work highly advanced colour graphics computer systems have been developed, providing much higher resolution than is normally available on a video screen.

This got him into an environment totally foreign to most solitary artists - he had to learn to organise helpers to operate the machines with him, and he had to learn to deal with the management. These continue to be sizeable preoccupations at JPL.

He is dependent on technical people because he has firmly resisted the temptation to learn the engineering skills involved in his art, for fear that he could easily dissipate all his energy just getting the equipment to work.

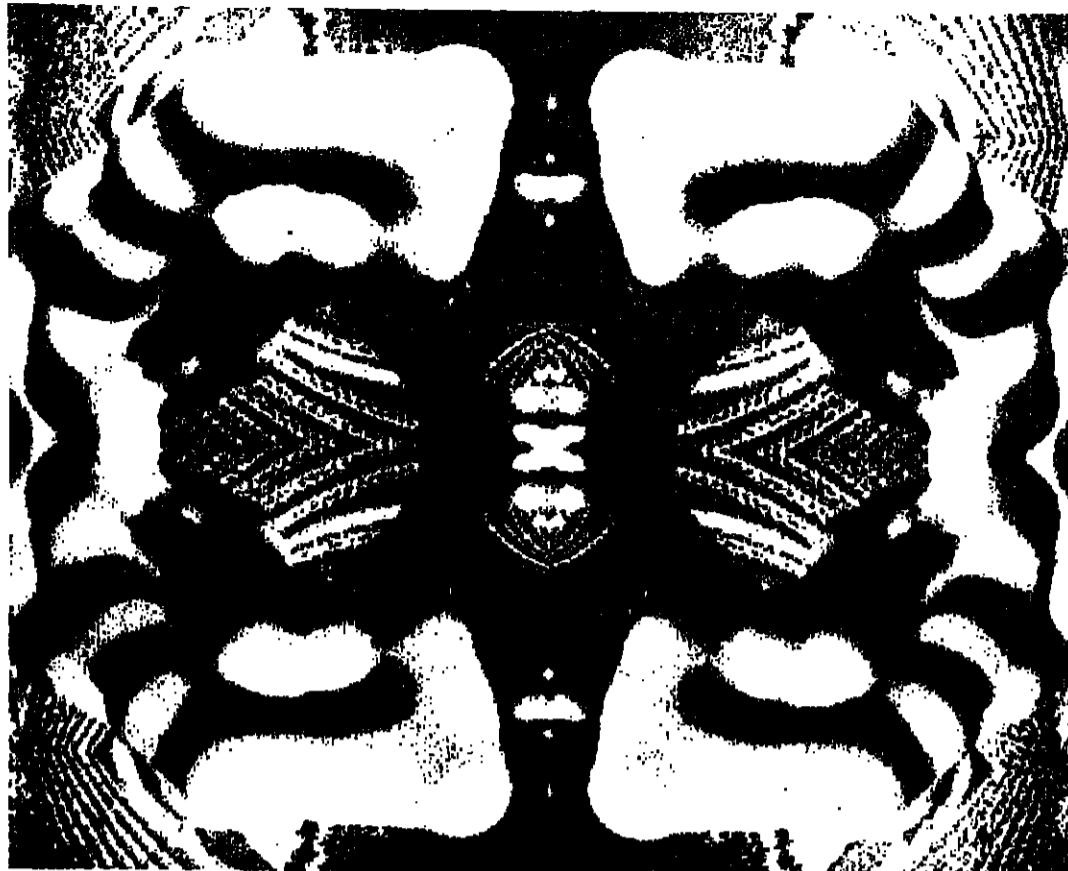
Too many artists he knows have learnt programming and now spend all their time writing software and never producing any pictures. Em is fortunate in having the help of a team of technicians who provide him with the software he needs.

The equipment is a PDP-11/55 with a digitising tablet and a high-resolution colour screen. The software, written by James Blinn of the Lab's technical staff, provides a choice of 256 colours and a range of "brushes" which vary the effect produced by the stylus on the tablet, from lines to fine "sprays" of dots that have been drawn into memory and then sent to the screen to be moved, copied, rotated, overlaid, and otherwise processed by a set of geometrical operations. The system is now fast enough to be interactive.

An originally novel part of the facility is the way surface textures and types of "space" can be generated "worn away" and added to pictures in progress. A database of textures has been compiled. The process of making a picture

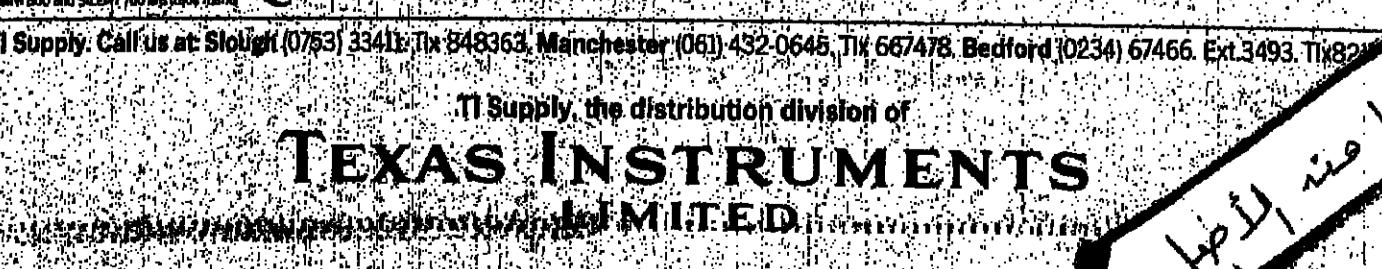
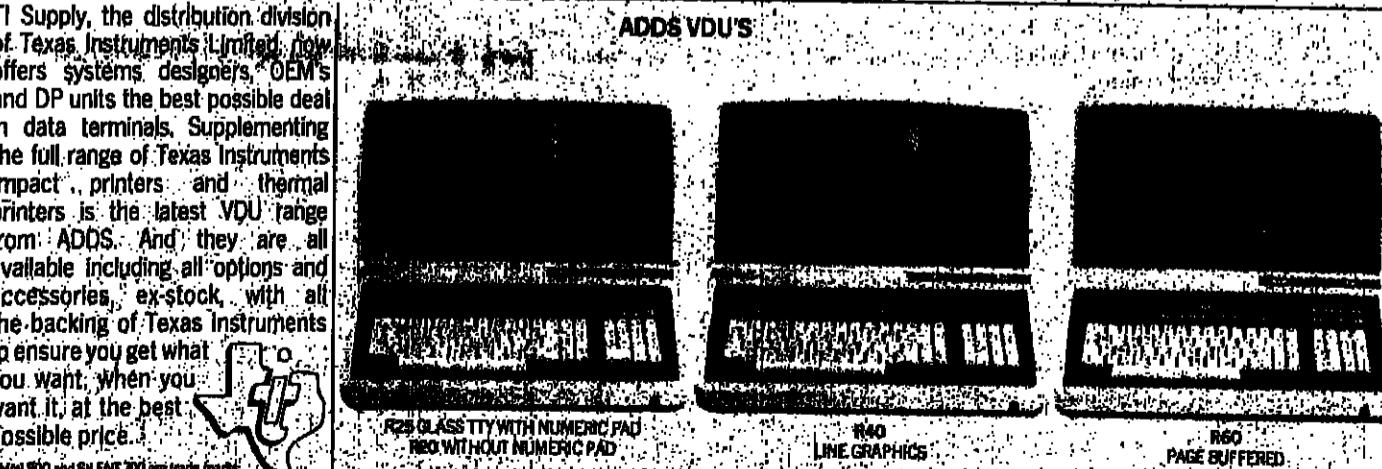
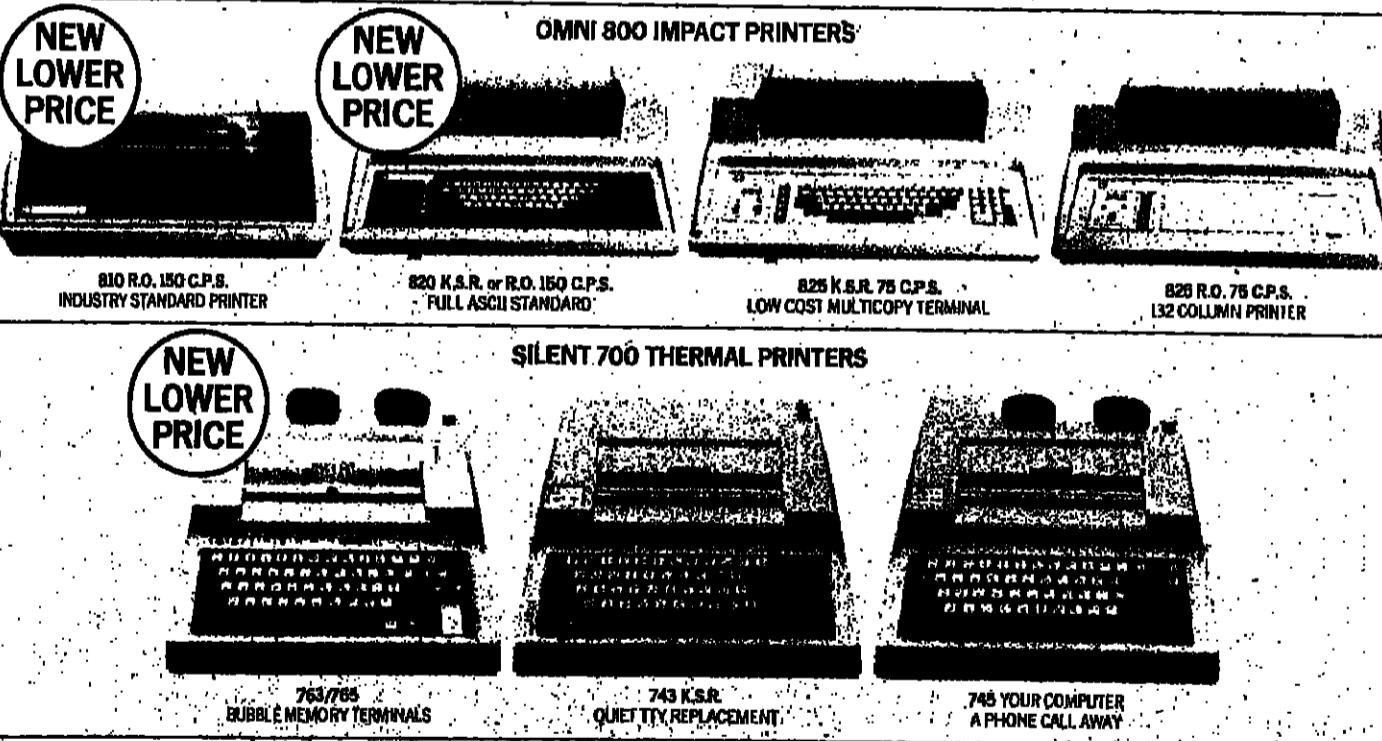
Rory Johnston reports on the remarkable results of a collaboration between man and machine in Pasadena

# Computer is 'leading the artist into new trains of thought'



David Em's picture MUMU2 was produced at the Jet Propulsion Laboratory with software by James Blinn.

## AVAILABLE NOW DATA-TERMINALS EX-STOCK FROM TI SUPPLY



TI Supply, the distribution division of Texas Instruments Limited, now offers systems designers, OEM's and DP units the best possible deal in data terminals. Supplementing the full range of Texas Instruments Impact Printers and thermal printers is the latest VDU range from ADDS. And they are all available including all options and accessories, ex-stock, with all the backing of Texas Instruments.

A major outside preoccupation of Em's is theatre, writing and directing multi-media productions in the host of ambitious small theatres that nestle around the film industry.

Em's pictures are used as scenery, projected from slides on to translucent screens around the set, and lasers, synthetic music, and bizarre insect-like costumes, also designed by Em, combine to produce plays like nothing that has been seen before.

Online projection of graphics using a television projector in the

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# Helping to lock the door against CP/M bootleggers ...

AN aid to protect software running on the CP/M operating system has been developed by a Gloucester-based company, which is now making it available to other CP/M authors.

Atec Computer Services is a bureau based in Blakeney, which specialises in auto test equipment. Four or five years ago Atec developed a new language, called Royal, which although recognised as something of a breakthrough in its own field, won the company hardly any revenue outside the UK because of bootlegged copies circulated among US users, estimated at 200,000 strong.

Determined not to get caught again, Atec's Roger Proulx wrote a safety harness for the software which had been developed as part of the bureau's move towards a mini/micro set-up.

The product, which goes by the in-house name of Code, is a two-part tool which prevents the copying of programs under the

CP/M PIP command. Effectively, it fixes the program to a physical part of the disc, and although it can be copied, the copy will be a garbled version which will not work.

Each program calls a small subroutine of code which gives access to the program through a password. A separate standalone utility creates characters on the disc which give the file to the physical disc and make it impossible to copy without the authorised password.

"Bootlegging really is a problem for us, so to protect our software we looked into the operating system itself as a way of preventing unauthorised copying," explained Roy Coldrick of Atec. "It's by no means a panacea as anyone who knows anything about the problem of bootlegging will recognise – it's just not possible to protect totally against the copy mechanism."

"This probably won't deter the determined hobbyist, but what we're aiming to do is cut out the kind of copying which takes place among small business end-users, who wouldn't know about sector-to-sector copying which this can't prevent."

"What we want to protect against is the PIP file-to-file copying mechanism, where the biggest problem is, Take Microsoft's Basic – I'd like to know how many copies have actually been bought and how many copied. I know of a dozen in this area alone, and this isn't exactly a hotbed of computing."

"I'm almost a bit embarrassed to go overboard about the product as we are relative novices on CP/M, although we do have a lot of experience elsewhere in electronics as well as mini- and mainframe operations. I think possibly we happened to notice a quirk of CP/M that we could use."

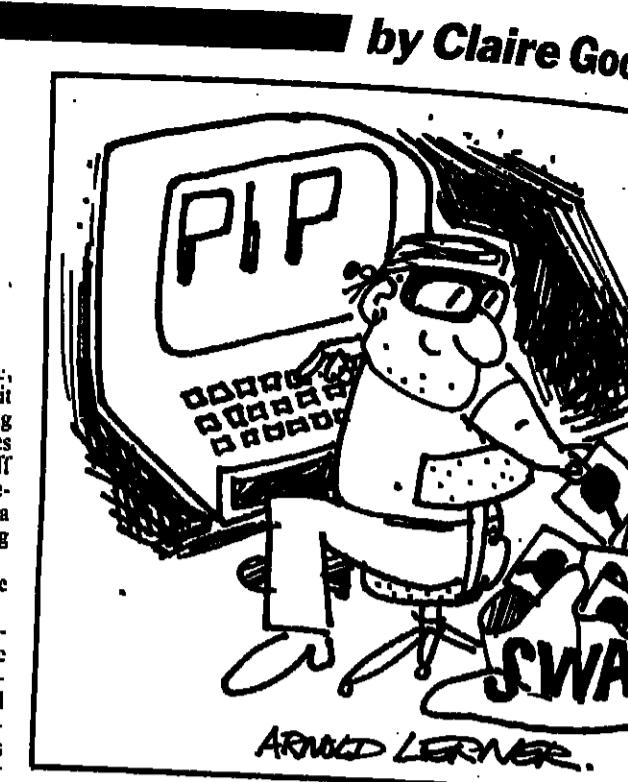
"One or two people have said that at £300 it's far too expensive, but my answer to that is that it could pay for itself by preventing just one or two bootlegged copies of a product. It's really a spin-off for us from our own software development, so we haven't given a great deal of thought to marketing it as yet."

The Code tool itself cannot be copied.

Many people in the micro-software business, which is the prime area where sales suffer from bootlegging, say that physical and technical deterrents are the answer. The most stringent of laws (and Britain hasn't even a clear policy as yet) will not deter the most determined of thieves.

Given the present hiatus in establishing copyright on software, those who spend time and money developing applications for such popular systems as CP/M are wide open to piracy; perhaps such products as Atec's go some way towards locking the door.

"One or two people have said



## ... and other pirates

THE romantic image of pirates should be shattered by the gathering of software industry pundits who are to pool their wisdom on the copyright and piracy issue.

The conference on Computer

Software Protection is taking place at the Waldorf Hotel, London, on March 3, and is organised by Gower Conferences. The well-known experts Peter Laurie, Alastair Kelman and Julian Allison are among the speakers.

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## Magnuson 'go-faster' enhancement for MVS

DOGGING IBM's footsteps, Magnuson Computer Systems has announced its own microcode "go-faster" enhancement for users of IBM's MVS operating system, promising a 17 per cent performance improvement on Magnuson hardware.

The product, called MVS Extended Facilities, uses IBM's own Systems Extension and Systems Product software. For Magnuson's MVS operating system, promising a 17 per cent performance improvement on Magnuson hardware.

The enhancement allows a low-cost Magnuson 80 system to be added to MVS installations running offload applications and systems development work, explained systems manager for Magnuson US, John Rickard.

The Magnuson M80 is compatible with IBM 360, 370, 303X and 4300 series machines.

"What we're really doing is emulating IBM instruction sets,"

said technical director Howard Dowding. "If you look at most medium-sized plug compatible machines they haven't yet offered microcode to run large operating systems."

"We now have the advantage of being able to put in a Magnuson system with main storage in a slot running MVS/SE, to use the same level of OS. That means both machines use the same OS; only one lot of fixes or updates to do."

The product was developed at Magnuson's San Jose headquarters by a small team of microcode specialists, who work to emulate IBM announcements; "usually within 60 days". It has already been benchmark tested at Baco (Baco) in Houston.

On the smaller machines, M80/31, 32 and model 4, it can be purchased for £3,500, or rented.

On the larger range, M80/42, 43 and 44, it will be supplied as a standard feature.

## BBC database course

FOR those who missed the BBC's highly praised introduction to the world of data processing and database techniques, the series is coming round again on the Open University syllabus.

The course is aimed at those who already have a basic understanding of computers and computing, but want to appreciate the aims and uses of databases.

"Most of it has been shot on the shop floor," explained executive producer of mathematics John Richmond. "We look at how things are physically stored in warehouses, and how a picture is built from various procedures, then how it is reflected in the data structures used by the computer."

Details are available from John Richmond at BBC Open University, Alexandra Palace, Wood Green, London N22 5AZ.

## Test package

THE NCC is co-operating with the Southampton-based systems house Graham Computer Services in producing a testing package for ICL VME-based 2300/05 which will enable users to remove errors in logic, syntax and data before running programs online.

The testing package is the first part of a £15,000 NCC/Graham joint project based on Graham's TP2900 teleprocessing monitor and is the first project in the Software Products Scheme to concentrate on ICL-compatible products.

The report costs £75 for a full report, £15 for survey results alone.

The survey concentrates on the adequacy and importance of features, applications and software in ICL with other information on current and planned uses of the system among the 63 respondents.

The report costs £75 for a full

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The survey also includes an analysis of the cost of the software and the cost of the hardware required to run it. The report costs £75 for a full report, £15 for survey results alone.

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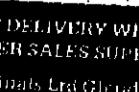
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# Poland will phase out the import of Western computers

by Bohdan O. Szuprowicz

RECENT developments in the Polish data processing industry suggest that there is little chance of Poland becoming an expanding market for Western hardware. Regardless of changes in East-West trade policies, ICL, IBM and CDC will all lose their market shares in coming years.

Reporting on recent deliberations of Poland's Committee on Science and Technology of Informatics, the magazine *Informatyka* points out the need to limit Poland's computer hardware production and imports. This decision is dictated primarily by the necessity to slow down capital investment within the Polish economy and reduce the outflow of hard currencies. Poland owes over \$20 billion to Western bankers and between 60% and 70% of Poland's export earnings are already committed to servicing that debt.

In these circumstances, imports of Western hardware have been reduced to a trickle and old computers imported from the West since 1965 are being replaced by minicomputer models are being produced under licence in Poland alongside the domestic Mera 400 series minicomputers.

Among major Western manufacturers likely to lose their market share in Poland are IBM, ICL, and CDC. By 1985, only 10 Western general purpose machines are scheduled to remain in Poland if each Western computer is exploited for the typical 10-year depreciation period practised by Polish end-users. These Western remnants are expected to include an ICL 2913, two IBM 370/148s, two CDC Cyber 73-16s, Univac 1106, a CDC-11 Iris 80, and three Singer S-10 systems, all of which are already rapidly becoming obsolete. This is a far cry from 1979 when there was a total of 42 Western computers in Poland including 15 ICL, 13 IBM, and five CDC machines.

The 1980-1985 general purpose computer deployment plan for

the Polish computer industry

also aware that without integrated LSI components to its products, it is impossible to bring their prices down to make them competitive in export markets. Their minicomputers and peripherals which they hope to sell to the West. And without currency earnings the Polish industry cannot make a case for West hardware imports for its own users.

ITC threat to shut in France

by Jack Gee  
ITC has warned the French government that it will shut down operations in France unless the president, Valéry Giscard D'Estaing, gives orders to stop discrimination in handing out major telephone orders.

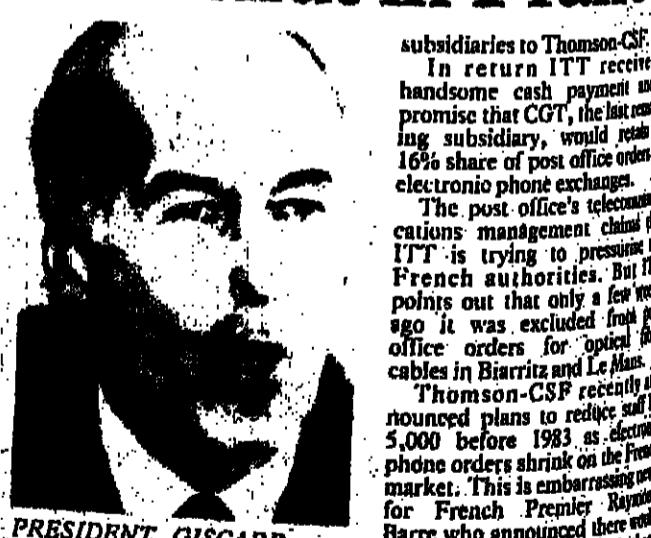
After waiting impatiently for the French post office's telecommunications management to select its System 12 telephone exchange, it is shutting down 700 jobs in its last surviving French subsidiary, Compagnie Générale de Construction Téléphoniques.

COTC, which has a payroll of 7,500 and four French factories, is likely to be sold if the System 12 order does not materialise within the next few months, according to ITC's European president, H. John Guillouye.

ITC complains that the French government has deliberately been favouring Thomson-CSF, CIT-Alcatel, SAT and Matra in placing its electronic contracts.

PRESIDENT GISCARD  
"It would be a scandal."

The US firm considers this a breach of promise by Giscard, whose officials persuaded ITC in 1976 to sell two of its three French



subsidiaries to Thomson-CSF. In return ITC received a handsome cash payment and a promise that CGT, the fast-growing subsidiary, would retain a 16% share of post office ordered electronic phone exchanges.

The post office's telecommunications management claimed ITC is trying to pressure French authorities. But ITC points out that only a few months ago it was excluded from post office orders for optical fibre cables in Biarritz and Le Mans.

Thomson-CSF recently announced plans to reduce staff by 5,000 before 1983 as electronic phone orders shrink on the French market. This is embarrassing news for French Premier Raymond Barre who announced there would be no job cuts in the French post office.

President Giscard also said recently: "It would be a scandal if people were dissatisfied with France's telephone industry."

required previously.

The reports began to circulate a few weeks ago and according to US sources the likely objective of the exercise is to obtain an agreement which would exempt American companies from the so-called 'Soviet tax'. This would be in return for the American companies to install their Aeroflot from US taxes.

Other US companies continue to claim that the firms received rebates for more information than the Soviet firms.

## MICRO NEWS



Commodore's entry in the lower end of the personal computer market is marked with the introduction of the VIC 20 (video interface computer). The VIC is expected to be available at Easter for under £200. Based on the 6502 eight-bit microprocessor from MOS Technology, a Commodore subsidiary, the VIC has 5K of RAM expandable to 32K, 12K of Pet Basic ROM, a single I/O port and can operate with a 20-column screen.

# Shortage of test engineering staff unless work is automated

HALF the cost of a microcomputer goes into testing and other related work, and unless it can be automated in the near future there will be a tremendous need for skilled test engineering staff.

This point was made by Dr R. G. Bennets, of Circus Computers, at the latest meeting of the British Computer Society, in London.

Addressing the Microprocessor Specialist Group, Dr Bennets spoke on the testing of bus-structured boards.

Producing test programs for bus-structured boards and then debugging them to fit all sorts of problems for the engineer. It required a high level of skill including that of a hardware or systems designer, and of a software writer.

Dr Bennets stressed that test engineers should not be thought of as failed designers. Their pay, usually, was often less than that of a design engineer, said Dr Bennets.

He discussed the test under three headings: test program generation, evaluating the test

program, and actually diagnosing a fault on a board. These tasks were complicated by various factors.

Often, incomplete or incorrect data sheets were supplied by the manufacturer and differences existed between components from the original manufacturer and those from second sources.

Sometimes, there was lack of access to all the components on a board. Other factors included the sheer volume of test data needed and the variety and rate of change of the devices.

Debugging was complicated by the fact that it was difficult to simulate the faults. Documentation indicated all valid states of a chip but not always all the invalid states.

In fault finding, problems were caused by the tester not always being in control of what was happening on the board.

Tests could not always be done at actual run time speeds and the tester might have access only to the bus and not the actual components.

## Texas' 16-bit device available shortly

TEXAS Instruments' new 16-bit microprocessor, the TMS9905, will be available in the second quarter of this year at a cost of £23 for quantities of 100 or more. The chip, first announced six months ago, has an enhanced architecture but is still part of the 9900 family.

An evaluation module based on the 9905 will be introduced at the end of next month at a cost of about £395.

The board contains a monitor for program assembly, editing and execution.

Hardware features include two

EIA data communications links for interfacing with a local terminal and a host system.

Called the TMAM6095, the board provides 1K-byte of external RAM, and 6K-bytes of EPROM standard, which is expandable to 24K-bytes.

## Japanese invade

### US market

by Hesh Wiener, Technology News of America

JAPANESE companies have done well in the US, selling consumer products like cameras, televisions, hi-fi systems and video cassette recorders. Now, companies such as Hitachi, Nippon Electric (NEC), and Sharp are introducing their microcomputers on the US market.

The Poles are beginning to realize that there are used Western computers of comparable or superior power available at a fraction of the cost but they will pay for it in hard currencies in very short supply and are certainly not available for purchase that do not show the potential for generating export sales.

The Japanese computer industry is also aware that without integrated LSI components to its products, it is impossible to bring their prices down to make them competitive in export markets. Their minicomputers and peripherals which they hope to sell to the West. And without currency earnings the Japanese industry cannot make a case for West hardware imports for its own users.

There must be a lot of US firms just itching to get into the home and business microcomputer markets," McPhee says. "And they would be happy to sell Japanese micros."

Another approach might be for the companies to develop easy-to-use systems that would attract first-time users than do conventional approaches. "As new technologies creep in, you see a decline in memory prices," says McPhee. "Then you can squeeze more sophisticated software in, making the machine easier to use."

Some industry participants fear that once the Japanese companies make their presence felt in the US microcomputer market, there may be a reaction in the form of US protectionism. Tom Nugent, Panasonic US sales manager for its portable data system division, says, "As the market grows, there will be a build-up, followed by a shake-out. Finally, you can expect the emergence of a few companies that will control the market."

"Traditionally," says Mr. Phoe, "the Japanese lag behind the US in software. This is quick to add, "but any problems are a long way off."

## Speech synthesis chip

A 32-WORD speech synthesis chip is now available from ITT Semiconductors. The N-channel silicon gate MOS device which is mask programmable for different languages and vocabularies, marks the company's renewed efforts in the speech synthesis market.

Designated the UAA1103, the chip is suitable for circuitry which uses a linear predictive coding method whereby a mathematical model is made of the vocal tract. It also uses a phoneme method which involves separating the speech into basic sounds, called phonemes.

NS11E offers a memory capacity of 128 KByte (64x26). The newly developed correction procedure checks every single byte but won't loss speed in the process. Moreover, it works with only a single 5 volt supply current.

(The NS11E fits into the PDP-11/04, 14, 40, 44)

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# Cloud hangs over the Wall Street computer stocks

THE go-go computer stocks of last year's American bull market in high technology shares are now beginning to "come off," as the brokers put it. The reasons are not hard to find, as Americans begin to take stock of their new President, and the inflation-ridden recession economy he inherited.

Chairmen reporting on the current quarter's trading, often in the same speech in which they reveal last year's record turnover and profit increases (with some notable exceptions such as Burroughs and Memorex) have reported difficult trading conditions.

There were hopes late last year that the American economy was beginning to move out of recession, and President Reagan has taken the first of his promised steps to cut federal spending.

But very few economists believe that the turn has taken place. All the signs are that the cure which Reagan intends to apply will, as a very similar cure has done here in the UK, turn a recession into a full-blown slump.

Stockbroking firm Heseltine Moss, in its February newsletter,

says: "High interest rates lead to high sterling (foreign demand), lead to industrial slump (due to recession at home and exporting uncompetitiveness), lead to high unemployment, lead to high public sector borrowing requirements (social security costs and low tax revenue), lead to high interest rates due to the need to sell debts (government debt)."

The US is in the same vicious spiral, with both inflation and interest rates at far higher levels than in the UK. Currently American bank rate is 19% and inflation is at about the same level. Reagan administration sees Federal spending as the prime culprit, and the massive \$50 billion cuts the President wants will inevitably lead to a slowdown in trade to companies from federal procurement agencies.

And even that phrase, along with the general pessimism, is enough to set the shares back 20%, from just over \$34 to \$28 at one point.

However, that fall must be seen in the light of Prime's share price last year, which took the stock from \$14 to \$34 in a few months.

Anyone who bought early last year will still be showing 100% profit.

Apple fell back last week from a high of \$37 to just over the original offer price of \$28. This fall may

have nothing to do with the general US drift into gloom.

affecting Prime and other shares — it could simply be that some form of rationality is entering the investors' minds as they begin to meditate on the likelihood of a share ever being worth over 200 times the last known earnings of the parent company.

In the US, the new pessimism is the only possible explanation for the sudden fall in the shares of Prime Computers, which last week reported a record 84% rise in profit.

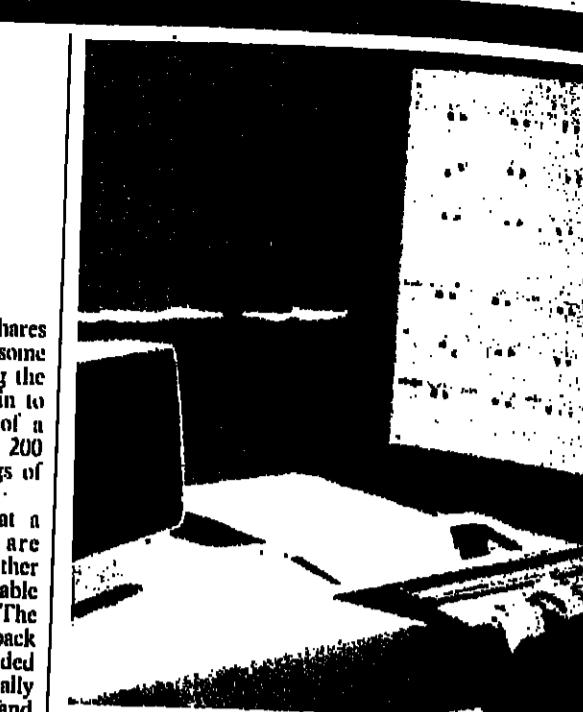
According to reports from New York, a number of big holders of Prime stock sold on the basis of a single phrase in the Prime president's report referring to "some order softness," in the current quarter.

There is also the fact that a number of commentators are beginning to wonder whether Apple can sustain the remarkable growth it has shown so far. The Apple microcomputer, on the back of which the company has founded its fortune, is less technologically advanced than properly priced and packaged for its market.

The Apple's basic components were around before Apple assembled them, and they have been getting cheaper ever since.

And even that ubiquitous giant IBM has recently reported on the effective slash in its share value, while shyingly borrowing billions on the side. Apple, like IBM, may begin to need expensive capital if it is to maintain the breakneck pace of its own development.

The share table on the facing page gives a good guide to the general US drift into gloom.



An operator demonstrates the Gordon and Gotech real time stockbroking system at the company's City offices.

## Major coup for City payroll system

GORDON and Gotech Computers, the data processing subsidiary of London trading group Gordon and Gotech, has announced a major coup for its batch payroll system.

Merrill Lynch, one of the biggest finance houses in the US, and said to be the largest computer user there, after the US government, has signed to run the UK payroll with Gordon and Gotech.

This addition brings to 40,000 the number of payroll slips being handled by Gordon and Gotech each week and month.

The results for last year, in the Gordon and Gotech holding company accounts, show that the computer companies in the group had a turnover of £2,319,000 and a profit of £310,000. This is a 13.3% return on turnover, and makes the computer bureau the most profitable subsidiary in the group, which had total turnover of £30.9 million and a profit of £1.2 million.

The Gordon and Gotech bureau business has been expanding recently, and the new computer centre at Staines in Middlesex contributing to what the company hopes will be a record year.

The dual running 4000 claimed at giving guaranteed delivery up to the specialised stockbroking service by Gordon and Gotech. This one, which now handles 15% of all share bargain transactions carried out by brokers of the London Stock Exchange, accounts for 60% of the bureau's turnover. Only four such packages and the service is offered by Gordon and Gotech either on an in-house system, or via the bureaux.

The majority of Gordon and Gotech's customers use the services from Burroughs equipment sited in the London offices.

## Computas sees a big future in teleinformatics

COMPUTAS, the Norwegian software house, which has offices in London, reports turnover up 23% to £6 million for the financial year just ended. Profit before depreciation was £600,000.

The company, which claims to be the biggest software operation in Norway, now has a staff of more than 200, and has additional international offices in Paris, Hamburg and Rotterdam.

Last year Computas started a subsidiary company in Sweden which the Computas managing director, Per Boman, reckons will be doing £1 million worth of business by the year end.

Boman says he expects to employ over 40 people in Sweden, to cope with this expansion.

Computas has developed a particularly strong position in the supply of software for technical applications in the engineering industry. The company produces packages to assist engineers in evaluating stress and to test the strength of load bearing structures

in five-year trend earning per share estimate based on log linear least squares growth rate.

Consensus estimate from Institutional Brokers Estimate System.

## Share forecasts put Honeywell ahead

EACH year the American business magazine Business Week produces a forecast of earnings per share for all the major US companies. Computer Weekly has taken an abstract of this year's forecasts where they relate to computer companies and we publish that list, with share price appreciation and depreciation as it occurred last year.

Points of interest are that on an earnings per share basis Honeywell comes out best in both the five-year trend and under the conservative revising of that figure by the compilers of the table.

IBM, on a five-year basis, looks set to improve earnings per share by about 20% — very unglamorous given IBM's image and track record. The IBM prospects come up much the same under the consensus view.

Only NCR is seen, with Honeywell, getting its earnings per share into double digits.

Control Data is forecast to share third place, with a potential rise of nearly 50%.

Only Memorex is seen as producing an earnings decline over the five-year period, though Burroughs, with its recent problems, must be a candidate for a downward revision.

Compared to other sectors of American industry the computer

companies show a consistently higher five-year trend, even when the consensus view is taken into account.

There is no similar list in the UK and only six companies listed on any of the stock exchange markets could be classed as predominantly computer companies.

The data in the table on the left was compiled by Standards & Poors Computas Services Inc from such sources as statistical services, newspapers, registration statements and company reports that SPCS believes to be reliable but are not guaranteed by either SPCS or Business Week as to correctness or completeness. The material is not an offer or a solicitation to buy or sell any security.

## Sharp growth

TURNOVER at I. P. Sharp Associates, the international APL time sharing service, was up 40% last year to £16.3 million. The 600 staff of the company will share in a record £272,000 bonus, nearly three times better than last year's profit share-out of just over £10,000.

The company is planning to open new offices in Singapore, Hong Kong and Bahrain.

## Mannesmann buys half of Kienzle

KIENZLE Apparatus, the West German DP to taxi meter company, is to receive a cash injection of £8 million from Mannesmann, the engineering group.

In return, the Kienzle family, who currently own Kienzle, will part with 50% of their equity for an undisclosed sum, understood to be £10 million.

The deal values Kienzle at £20 million, against turnover of £160 million and a workforce of over 8,500.

Mr Evans, joint managing director of the Kienzle UK company, said he was delighted with the deal, which would enable the com-

pany to go farther and faster in developing new products.

He hoped that the family atmosphere which had always been a feature of the company would remain, he said; Kienzle would not lose its identity under the deal and would continue to trade under its existing name.

Kienzle's UK company was set up in 1968 and now has a turnover of £10 million and employs 420.

The company specialises in supplying computerised accounting systems based on the K1900 machine to first time users. The company has recently ex-

## Capital for UK firms

ANOTHER venture capital source has emerged in the UK, this time in rural Cambridge. Venture Founders is a company set up by Brian Haslett, a graduate of Trinity College, Cambridge.

Haslett has just returned from a 10-year stint in America where he learnt how venture capital was used, and now has £2 million on offer to high technology entrepreneurs.

Mannesmann's profitability, measured against turnover, was a mere 2.5%. The company, like all capital project oriented business, has been under additional pressure since the recession began to affect Germany.

## LET'S GET IT CLEAR!

### TAB 132/15 DISPLAY TERMINAL

- High resolution, 15ins screen, green or white phosphor
- 80 and 132 characters per line, with horizontal scrolling
- Separate, movable keyboard and tilting screen
- Communications capability to 19200 baud, full or half duplex
- Standard reverse video facility
- Programmable, screen-labelled soft keys
- Durable, reliable keyboard resistant to dust and 'coffee proof'

### ALSO AVAILABLE LOW COST GRAPHICS TERMINAL

A poor video display is a serious weakness in any computer system. Illegible characters on a glaring screen don't do much for VDU operator's eyes - or for productivity.

You need a display terminal which suits your operator as well as your system. The TAB 132/15 does both, with many extra features; and at a price comparable to inferior 12ins terminals.

A 15ins screen, superior resolution from 392 scan lines (50% more than other models) and large, crisp letters formed within a 9 x 16 cell size to ensure maximum screen clarity.

VDU operator efficiency will also benefit from the 24 data lines carrying 80 or 132 characters, and the horizontal scrolling facility which prevents text from being lost while changing from one format to the other.

Eight screen-labelled soft keys provide the flexibility to handle current and future applications, without the need to memorise function codes and positions.

The TAB 132/15 has full communications capability, too.

We've made it as clear as we can. But if you want to know why the TAB 132/15 terminal is a better choice for your system, ask for a demonstration and see for yourself.



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Usenet: comp.sys.z80.z

# Look for self-adjusting opportunities when designing systems

VERY few self-adjusting system designs seem to be used in practice or reported in the literature. Yet they have proved useful on occasion; they simplify our system by taking over the burden of changing it to new operational conditions.

One of the most common and useful examples of self-adjusting software is found in the many operating systems which adjust program priorities and primary memory space usage according to current conditions. In inventory control systems the use of current data on orders, combined with historical data, serves as a basis for adjusting the minimum order quantity to a more interesting number than some constant number.

In the early days of disc drives (RAMAC for the old timers) a useful self-adjusting concept was to record the activity count in each record, and later, during file reorganisation, make use of that number to ensure that the currently most active records were placed in the best positions for fast accessing. I still use this concept of giving each individual product a maximum reasonable order quantity indicator in its record, was at first discarded as being too difficult to determine, and too difficult to keep updated in a reasonable way. Then we considered the possibility of creating and updating the "maximum reasonable quantity for this product" field by simply putting the highest quantity actually ordered in the field and requiring confirmation from the operator for any higher quantities. It can be used for double checking recovery routines (did all updates get repeated?) and has potential as a security check (unusual activity might indicate intentional fraud or errors).

In one database system we discovered by accident that when the file had been added to, heavily without a file reorganisation, it was much faster to access the records via a detailed index (which always required two seek operations, but never more) than via an indexed sequential search which started with an index in primary memory, and thus theoretically needed only one seek search and then perhaps sequential reads on the same cylinder.

This led to the discovery that we could sample and time each method in the morning start-up routines and then simply choose the access method which was operating fastest that day.

If you think about it we are really talking about programming the kind of reasonableness checking that human clerks perform

14 YEARS AGO

From Computer Weekly of February 23, 1967 (this column temporarily replaces our Ten Years Ago feature, due to the postal strike in February and March, 1971, which resulted in the suspension of Computer Weekly distribution):

WORK on designing a traffic control digital communications network (DCN) based on a British computer analogous to the Honeywell DPP 516 has been under way for the last year. This was announced by National Physical Laboratory. Autonomics Division director D. Davies at an Institute of Electrical Engineers' conference dealing with message switching technology. Elliott-Automation will take over GEC Computer and Automation Ltd, the GEC subsidiary which holds a five-year UK manufacture and sales licence for the SDS range of computers. Sigma computers are being sought cur-

rently by both the Medical Research Council and the Chilton Atlas Laboratory ... Elliott-Automation is also involved in tendering for a computer system to service automatic air traffic control data for Eurocontrol, the Brussels based organisation that monitors the higher regions of airspace above Western Europe. E-A joins Ateliers de Constructions Electriques de Charleroi (Belgium), Standard Elektrik Lorenz (Federal Republic of Germany) and Compagnie Générale de Constructions Télégraphiques (France) in the four-member consortium bidding for the contract.

**DOWNTIME**

## How to spot the (binary) time

If you look at my picture all you see is spots before your eyes, you are right. This is the latest gadget for the systems analyst who has everything imported from the States by Tamsoft of Windsor. It is the ultimate in ergonomic technology, namely a binary reader.

The digits run horizontally, one for hours, two for minutes, and two for seconds, and the bits run vertically with the LSD at the top. Thus the clock in the picture says 12:35 and 37 seconds. Note that there is none of this new fangled nonsense about 24 hour time, and to keep you on your toes the minutes and seconds are in BCD while the hours are in straight binary. Clever stuff!

Thus you can be driven mad by flashing lights and keep your brain's powers of information processing exercised at the same time. You get all this for a paltry £52 - in genuine plastic imitation wood, that is. If you want plastic imitation plastic it will cost you £72.

Readers may be puzzled by the price, considering that one can buy digital clocks with decimal reading for around £10, but I think I have sorted this out. You see, the logic chips available all have identical seven-segment outputs, and if circuitry is needed to convert these back into binary again (to be converted back into decimal by the brain). No expense has been spared.

I certainly hope this is a trend that will continue, even now I understand an enterprising firm in Stoke-on-Trent is developing a computer terminal costing only £9,999.99, that emits ASCII characters as a series of pulsed tones from a loudspeaker for the user to interpret, using his own built-in carbo-chip circuitry. The advantage of this is that nothing has to be done to the terminal to switch from ASCII to EBCDIC. The user simply swaps a new code.

The only thing that is worrying the manufacturers is that someone is speaking about who came up with the platform and he says "Oh, it's SOT". You know, the SOTs Old Fools Association.



**Tom Gilb** is an independent consultant, lecturer and author on computing topics.

How many of you have thought of the concept of a self-adjusting database access method set? It might be more effective than a single, method, no matter how effective that method is.

In another application of this principle, an Austrian savings bank posed the problem that they wanted to use the birthdate of personal account holders as a security and reliability check before approving cheque amounts by telephone. The problem was how to collect a million birthdates for their database before beginning the system. I suggested to the DPM manager who posed the problem to me on a course, that they start up without the birthdate. It would be keyed in, but if it was not already present (due to a previous inquiry) it was simply noted in the database for future reference! If desired another security check such as process current transactions on them. This tends to improve response of the systems. It gets the systems on the air earlier, too.

A steel company wanted better reasonableness checking in an online order entry system. They wanted to avoid repeating the ordered quantity twice, and were not satisfied just checking that the quantity was not utterly ridiculous.

The idea of giving reasonable limits on major groups of products was discarded as not providing tight enough controls. The idea of giving each individual product a maximum reasonable order quantity indicator in its record, was at first discarded as being too difficult to determine, and too difficult to keep updated in a reasonable way. Then we considered the possibility of creating and updating the "maximum reasonable quantity for this product" field by simply putting the highest quantity actually ordered in the field and requiring confirmation from the operator for any higher quantities.

I have used it in many variations (example, customer name and address collected as the first order comes in, and not by a special file update to register the customer before any order can be processed).

**Tom Gilb**

From Computer Weekly of February 23, 1967 (this column temporarily replaces our Ten Years Ago feature, due to the postal strike in February and March, 1971, which resulted in the suspension of Computer Weekly distribution):

Systems programmers, designers, software engineers, and people with a foot in both software and hardware camps are still able to command the kind of respect, not to mention salary, that programmers used to get simply for being in the right trade at the right time.

Copyright protection is

(though not in the UK) a notification of a claim of copyright by the inclusion of a copyright notice on all publicly distributed copies from which the work can be visually perceived - either directly or with the aid of a machine. Failure to place a copyright notice in the ROM, that all who read the work could not avoid seeing it, is to the Data Cash claim, and a decision of the District Court affirmed. Nevertheless it is possible that the plaintiff may act for unfair competition which has yet to be tried.

The lesson for those in the business who market programs or software is that copyright protection is ineffective, but that care should be taken to include a copyright notice on all copies of the program.

The judge in the Chicago District Court held, surprisingly,

## LEGAL OPINION

# Stamp your name on it!

**Bryan Niblett** is a barrister, computer scientist specialising in the legal problems associated with computers.



IT IS slowly becoming recognised that copyright law is an effective and simple means of protecting ownership of computer programs. A decision of the US courts in a case involving Data Cash Systems, first reported in late 1979, appeared to put copyright protection in jeopardy - at least in the US and for programs embodied in read only memory. In fact an appeal showed the fears were premature, but the case still has an important lesson for those in the UK who license software overseas.

The action was between Data Cash and the JS&A Group, first heard in a Federal District Court in Chicago. Data Cash had employed a consultant to develop a program which was able to play chess at six different levels of difficulty. The program took the usual form: instructions were coded in a high-level language to produce up-to-date in your databases and tables. Look for self-adjusting opportunities when you design systems - they are present in most systems if you are tuned in to them.

So, consider letting current

up-to-date in your databases and tables. Look for self-adjusting opportunities when you design systems - they are present in most systems if you are tuned in to them.

Graduate recruitment has been drastically cut by many firms, and some programmers - the latest casualties being from that doyen of the software scene, CAP - are even finding themselves redundant. The recession has meant that people are sitting tight with the jobs they already have.

However, the much-discussed "people problem" has not disappeared. There are areas - research and development was one pointed out on this page last week - where the right people are in great demand and short supply.

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# ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, February 26, 1981

## An industry that expects more

REMEMBER the days when you could while away your time on the Tube finding out if you'd made a computer programmer? The industry was then so desperate for staff that, according to the adverts, if you could follow the sequence 5, 7, 9, 11 with the number 13, you were made.

The device, known as "The Last One", because in theory, it is the last program that any human would have to write is the invention of David James and Scotty Bambridge in Ilminster, Somerset.

If the device is in fact a piece of hardware totally compatible with all computers and does all that it is said it can do, then indeed this is truly a breakthrough. However it is this device is a collection of programs that allows the user to ask for various types of programs to be written automatically, then I see no reason for the astounded response from the computing community.

I am sure most competent programmers using a high level language (and I do not regard Fortran as these routines were interactive, plus any calculations required. The rest of the routines structure, naming of variables, labels and an-

## LETTERS

# An invention that could 'make programming redundant'

IT was interesting to read about the article by Adrian Berry in the Daily Telegraph (1981 All That, February 19) regarding the "device" that can be fed into any computer and make programming redundant.

The device, known as "The Last One", because in theory, it is the last program that any human would have to write is the invention of David James and Scotty Bambridge in Ilminster, Somerset.

If the device is in fact a piece of hardware totally compatible with all computers and does all that it is said it can do, then indeed this is truly a breakthrough. However it is this device is a collection of programs that allows the user to ask for various types of programs to be written automatically, then I see no reason for the astounded response from the computing community.

I am sure most competent programmers using a high level language (and I do not regard Fortran as these routines were interactive, plus any calculations required. The rest of the routines structure, naming of variables, labels and an-

answer telling, were all handled by this program.

I must now add that Normalair Garrett Ltd does not now use this technique for generating functions. The reason is clear.

If you have to resort to writing a program to write programs, then you are (1) using too low level language, (2) structuring your subroutines at the wrong level.

We could not be accused of using a low level language. APL does in fact allow you to write your own language shorthand to suit your needs. However, further thought and investigation resulted in a very powerful set of subroutines (slave routines) that allowed interactive programs to be written very quickly, yet gave the programmer sufficient control over the internal structure of the programs he was writing. This is the end proved to be the best compromise.

Being a very logical and flexible language it took all of 45 minutes to write a program, which reduced the time required to write one of these routines from half a day to about 10 minutes. It did this by actually writing the routine for you. All that was required by the program user was for him or her to input the required question text, as these routines were interactive, plus any calculations required.

I am sure most competent programmers using a high level language (and I do not regard Fortran as these routines were interactive, plus any calculations required. The rest of the routines structure, naming of variables, labels and an-

I SUGGEST that the many people with computing qualifications but no experience consider taking a part-time degree of Master of Philosophy with the computing department of the local university. This involves a minimum of two years' research starting at any time of year and in order to succeed you should be able to make a modest contribution to knowledge.

The normal qualifications required will be a degree in a science subject or equivalent but an HND in an appropriate subject could well be considered equivalent. The fees vary widely from £250 per year upwards.

If you choose your project wisely to involve the computer language and field of computing which you wish to use in full-time employment you should be able to use the university's computer for four or five evenings a week and thus gain some worthwhile experience. You will also have the assistance of your supervisor.

The advantage of this course is that provided you do not spend more than 25 hours a week on the project and are able to take up full-time employment at any time if this is offered you can still draw unemployment benefit for the first year of unemployment, though social security if necessary in the second year could cause a problem.

If you can do without unemployment benefit a full-time course will take one year minimum and the fees will be higher.

Full-time M.Phil student at Bradford University

MR LEIGH asks (CW, February 12) is it fair to introduce a new set of symbols and call them conventional.

I didn't introduce them. They are used throughout Ken Bowles' book, Problem Solving Using Pascal (Springer Verlag, 1977), and there are earlier versions of UCSD Pascal and an original and imaginative teacher his ideas merit serious attention.

This is not due just to the rarity of such skills, though it does suggest that it is not just Cobol-coders that TOPS should be training. It's a reflection of the fact that the computer industry itself expects more from its people as well as its machines these days.

Everyone else is trying to make the most of existing resources efficiently, as witnessed by the boom in such application areas as financial modelling and materials planning. Users are allocating computer resources more carefully, not just turning to the package solution, and making more use of productivity aids where in-house development is inevitable.

That means more effort put into activities which give the end user more power, operating systems, development aids and other such tools. The result is bound to be (as has long been foreseen, if somewhat overstated) less need for the common-or-garden programmer.

It's not such a bad thing if no applications programmer ever has to write a date routine again. The end user is increasingly aware that quality matters - and so it should.

A.S. Computus, Norway.

**ROY ATHERTON**  
Head of Computer Education Centre  
Bulmershe College of Higher Education, Reading.

**DAG HAVRAAEN**  
Vice-president  
A.S. Computus, Norway.

**G. WISE**  
Information Services Office Systems Controller  
Mazda Car Imports, Longfield Road, North Farm Industrial Estate, Tunbridge Wells.

We are also building ourselves up very strongly in the international market place and intend to

become a force to be reckoned with.

Today you will find our departments or projects in London, Paris, Amsterdam, Hamburg, Portugal, Iraq, South Korea, Thailand and New Delhi.

**THE BIGGEST IN NORWAY**

COMPUTER WEEKLY takes a little time to reach us here in Norway, but we read with interest a short report concerning CAP Gemini's taking over the Norwegian Data Logic (CW, Jan 22, 1981). Data Logic is described as "According to CQS Data Logic is the largest Norwegian company in the field of professional computing services, excluding service bureaux".

The lesson for those in the business who market programs or software is that copyright protection is ineffective, but that care should be taken to include a copyright notice on all copies of the program.

The judge in the Chicago District Court held, surprisingly,

to be published on

2 March 1981

**Don't miss the Financial Times Survey on Computers**

**Make sure you get your copy of the Financial Times.**

**1984 and all that . . .**

THIS week's example of the strange things people say in the media about computers was seen in by M. D. Walker of London N16, who writes:

"Now, instead of forcing you to read what we have written, we send you a blank letter for you to read into whatever you wish. An

answer telling, were all handled by this program.

I must now add that Normalair Garrett Ltd does not now use this technique for generating functions. The reason is clear.

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## OP SPOT

# 'Ops should be chosen for their logical thinking and abstract reasoning'

PROTOCOL Operations' inaugural event at the Coburg Hotel, Bayswater, London was a greater success than its organisers had anticipated. More than 60 managerial heavyweights ("I only know half of them here," said director Chris Schaefer) heard four speakers talk of the company's wares.

Graham Lund, operations manager for Royal London Mutual Insurance, chaired the proceedings and said that the purpose of the forum was to look at various methods of training.

The first speaker, Phil Wilson, who is ops manager for the Readers Digest, gave his thoughts on tailoring courses for particular installations.

An advocate of increased responsibility for the operations department, he encourages the view that operators should be chosen for

"their logical thinking and abstract reasoning power". He feels that the future will bring technical hurdles for ops as they become involved with more sophisticated software, distributed processing and telecomms. (He will be featured on this page soon dangled from a hang-glider.)

Wilson was followed by John Davies, Whitbread operations manager. He talked about external education and training courses.

Another promise is for a steering committee of users with the power to influence what happens.

"It should be," says director Paul Brunton, "like a CUA with teeth."

The emphasis throughout the event was on training at all levels from the new entrant to the top dog.

Fry also listed the different times when training might become a priority. Included in that list were manufacturer or OS conversion, software enhancements and organisational restructure.

Managing director Malcolm Fry wrapped things up and said that Protocol was keeping its options open at this stage. He promised a

"If we owned Rolls Royces," said Phil Wilson, "we wouldn't ask a chauffeur to drive it unless we were sure he could drive."

Malcolm Fry, managing director of Protocol Operations, making his pitch to some of his potential customers.

# Computer Weekly brings you COMPEC NORTH'81

Belle Vue,  
Manchester  
June 23-25, 1981



# COMPEC NORTH'81

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## For better communication with the heart of industrial Britain

The sponsors and organisers of COMPEC are proud to present the first extension outside London of that event

The largest, most comprehensive and most visited computer show in Britain! For details, send the coupon NOW.

## Now for something completely different

IN the beginning, about 1977 in fact, marketing people discovered one of those "massive potential growth areas" they like to talk about. They called it the home computer market and small computer systems were given homely names like Pet and Apple. They became the most successful members of a small systems fraternity, and fortunes were made as they became tools in education, engineering and business.

Hard on the heels of these un-domesticated roles comes a program which, if successful, could bring a huge domestic market into life.

Computer Weekly's US Deep Throat has revealed a grubby little marketing idea from a merchant in Houston, Texas.

Syntonic Software has introduced what it coyly calls a passion program. This is a tenter's worth of suggestions on sex, a digital Kama Sutra no less.

## Move to MVS seen as obvious choice

OF the 450 or so UK sites still using OS/VS1, about 10% are expected to be represented at a two-day briefing called OS/VS1 to MVS. It is organised by Malden-head-based Xephon Technology Transfer, and there will be three speakers who have experience of the conversion.

The contention is that IBM intends to squeeze out OS/VS1 as its mid-range operating system. DOS users are being encouraged to stay with DOS/VSE rather than move to OS/VS1. Software and hardware products no longer support it.

Xephon's view is that, for the majority of OS/VS1 users, the move to MVS is the most obvious choice. IBM and its eager sales people also favour the MVS choice.

There are strong arguments in favour of MVS.

The smallest practical machine on which to run MVS is something like the likes of a 4-megabyte 370/158, so to an extent, MVS equates with substantial hardware costs. IBM likes to believe that the processing requirements of its superusers will grow at an annual rate between 20% and 45%.

Xephon does not reckon that choices for an OS/VS1 user, other than MVS, are particularly numerous.

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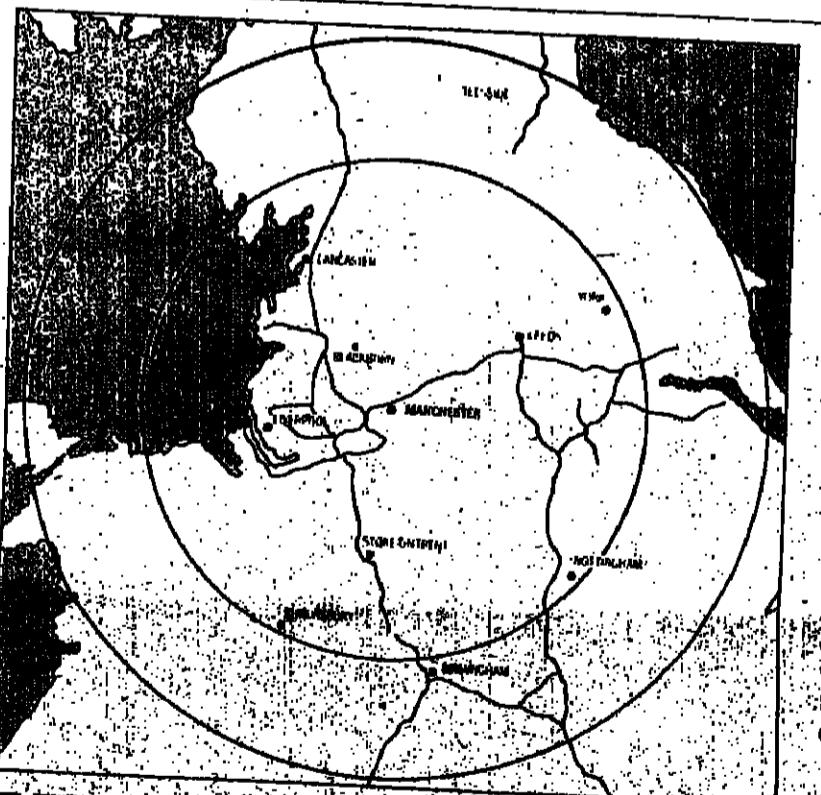
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# Computer



# Function networks are a neater basis for design

DURING functional analysis, one of the main tasks to be completed was that of functional decomposition which was the progressive breaking down of the main functions of the business into sub-functions.

The result was a series of function hierarchies which showed in increasing detail the tasks done to achieve the enterprise's objectives.

Two examples were used to illustrate function hierarchies. A simple everyday example "Household Management" was decomposed down to the "Make Tea" function to show what tasks needed to be completed to "Make Tea".

Then a very simple function from the hospital example was shown and used in later articles on data flow diagrams, access path analysis etc.

There was one point stressed in the functional decomposition, - functions can occur quite legitimately in more than one hierarchy.

This point is important to this stage of analysis, because it results in the drawing of function networks. A function network is the result of combining the function hierarchies where common functions occur.

What is the purpose of function networks?

- Common functions indicate that common programs or modules can be used to support higher level functions. A function need not be implemented directly as a program, module or subroutine.

For example, two functions may be supported by one transaction program, because of the way the database has been designed.

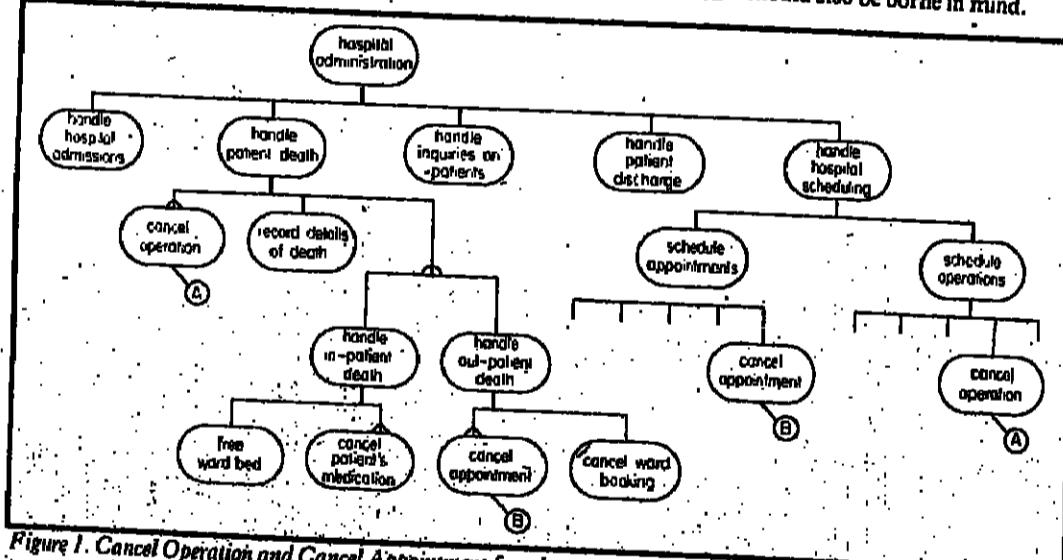


Figure 1. Cancel Operation and Cancel Appointment functions.

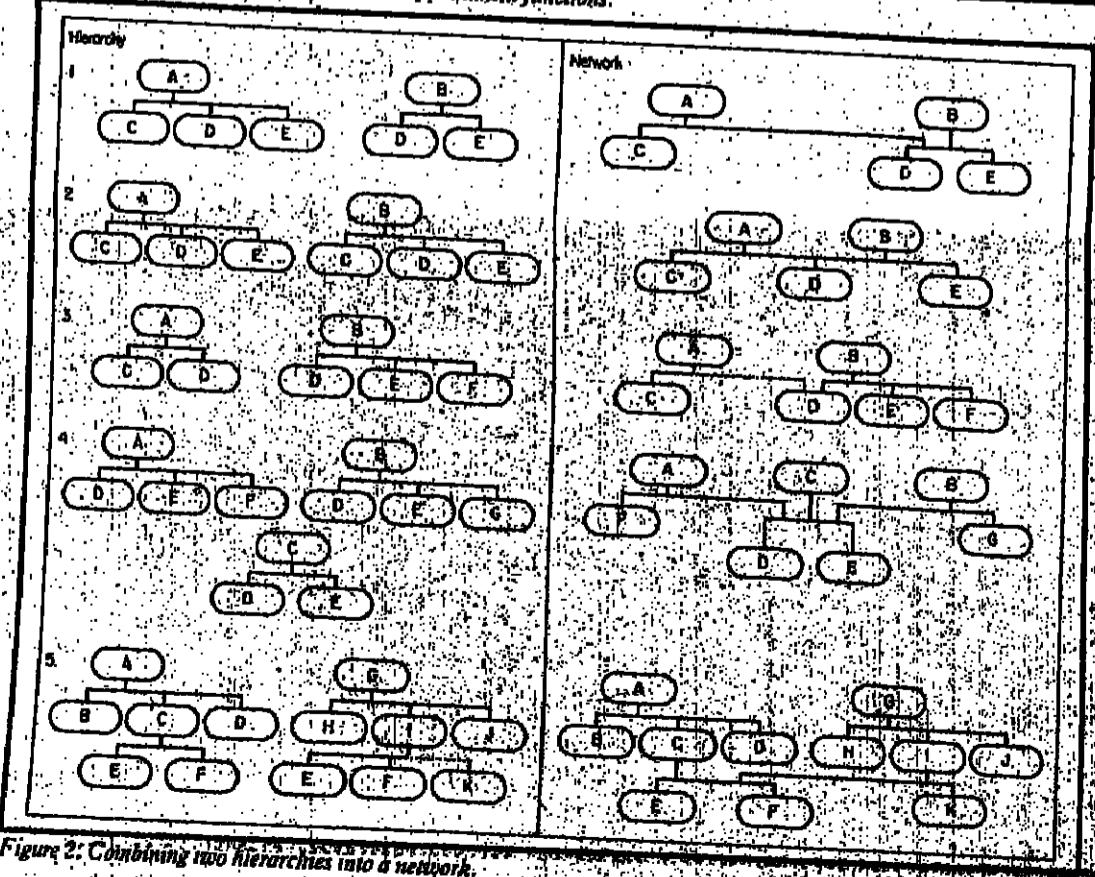


Figure 2. Combining two hierarchies into a network.

## Section I - Part 19 of our series describing a system design methodology

by Rosemary Rock-Evans

On the other hand, a function may be split, because it is considered that the resultant program would exceed the core size permitted for an installation or exceed the execution time permitted.

However, functions are always supported by transactions which are the basis of the programs, modules or subroutines.

It is obvious that by finding the common functions, modules can be written which can be used in the execution of many transactions and immense development effort is saved in programming, testing, debugging etc.

If functional analysis is being used for organisation studies, common functions can indicate that common practices are required or that the task might be best allocated to one job rather than split over several jobs.

The action of drawing function networks can result in the analyst finding that although two functions seem different they are in fact the same, because the user defining one function forgot to tell the analyst about all the tasks involved.

In Figure 1, for instance, there appears to be a common function "Cancel Operation". Let us assume, however, that on looking at the function definition we find that "Cancel Operation" for "Handle Patient Deaths" involves the two tasks: change status of operation to cancelled, and produce details of the operation cancelled.

On the other hand within the scheduling function, "Cancel Operation" involves the tasks: change the status of operation to cancelled, change the doctor's operating schedule, produce details of the operation cancelled, disseminate details of the cancelled

operation to all nurses and doctors involved, and reschedule the operations.

This looks suspicious, as the two functions appear as though they are in fact the same.

However, functions are always supported by transactions which are the basis of the programs, modules or subroutines.

The result is that the analyst goes back to check with the user who discussed the "Handle patient deaths" function.

Very often, functions which look as though they ought to be the same, are the same, and checking with the user results in changes to the definition of functions.

Function networks become another method of verifying that the results of analysis are correct.

1. Using the function hierarchies and (very importantly) the descriptions of the functions, determine which functions have:

a) Exactly the same input in terms of entity types, attribute types and relationship types.

b) Exactly the same output as above.

c) The same tasks or actions.

If two or more functions satisfy the above criteria they can be regarded as identical.

2. Mark on the function hierarchies the functions which are identical.

This can be done by using a different coloured pen to that used for drawing the hierarchies, and either numbering the boxes or circling them and joining them together, whichever is more suitable.

Figure 1 demonstrates a hospital example. A - "Cancel Operation" and B - "Cancel Appointment" have been identified as common functions in two hierarchies.

The point made about finding functions which appear to be different but are in fact the same, should also be borne in mind.

In our example, it has been assumed that where the functions have the same name, they are in fact the same.

5. Figure 3 shows the results of combining the functions identified as being common, in the hospital example from Figure 1.

Once the function network is complete, it should be possible to draw a complete data flow diagram of each level of network. This is because all data flows should now be checked and should have been cross-checked.

A data flow diagram is always drawn for the elementary function level using the results of entity life cycle analysis.

The result should be a complete picture of all data flows in the area under study, together with the "sources" and "sinks". These are functions outside the area of study where data originates and where data goes.

These are not defined precisely, they are there merely to help analyse see where the boundaries of the area of study are.

6. Figure 4, the life cycles of the teapot and kettle have been inverted and combined.

We have returned to our simple household management example to show the result.

In Figure 4, the life cycles of the teapot and kettle have been inverted and combined.

Function networks are more compact and neater than function hierarchies simply because a duplication has been removed as they provide a basis for program design and a method of verifying the results of functional analysis.

The Data Analysis methodology was developed at CACI by Ian Palmer.

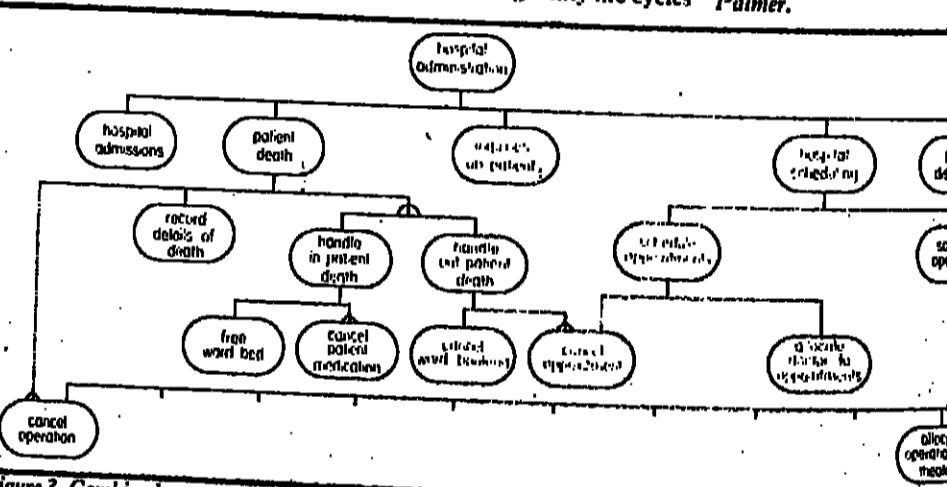
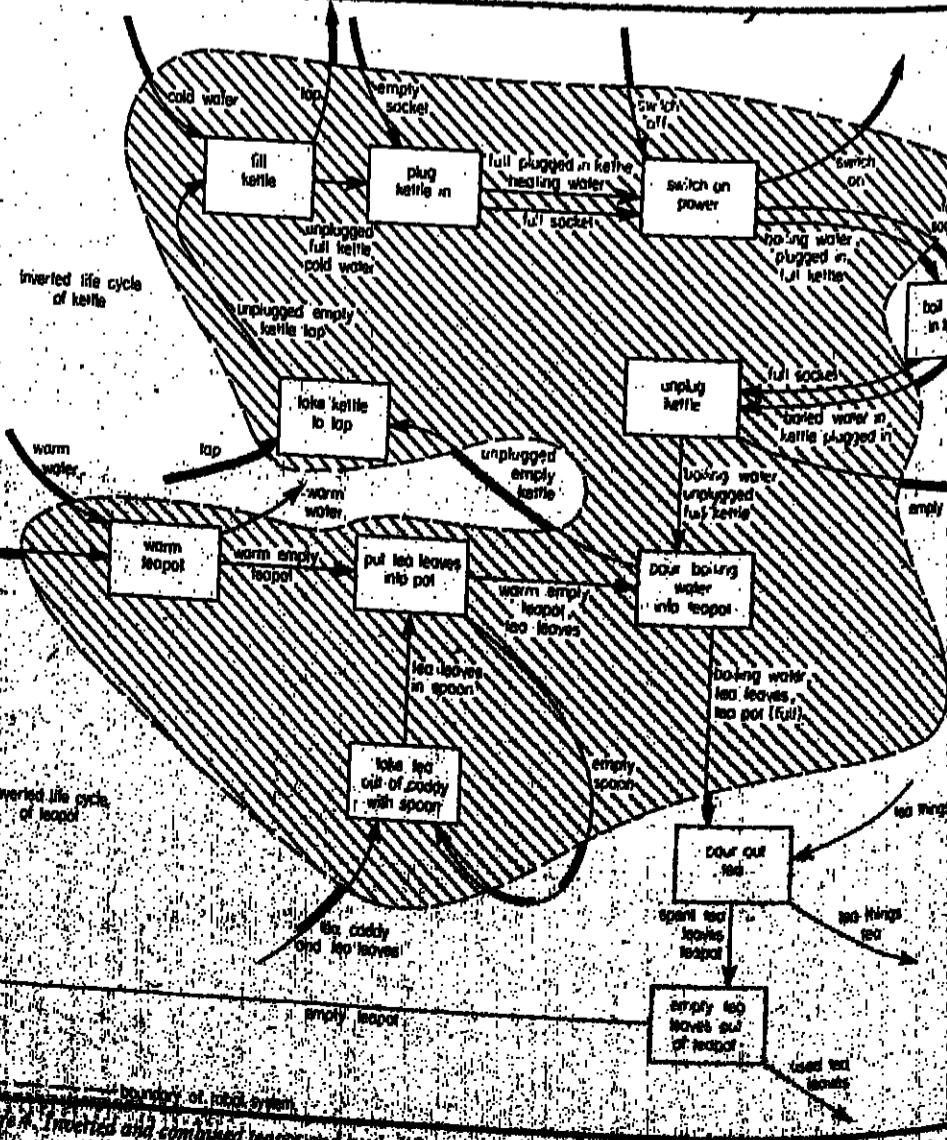
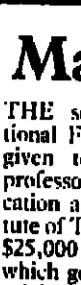


Figure 3. Combined common functions from Figure 1.



## PEOPLE

# From Moscow back to the IBM board



Rushton

Taylor

Grayson

Birt

THOMAS J. Watson Jr, son of the man who built IBM, has returned to the board of directors after serving for a year as US Ambassador to the USSR.

Watson has spent 33 years with IBM, joining at the age of 23 and becoming president in 1952, when he was 38. He was chairman from 1961 to 1971 and the corporation's chairman of the executive committee from 1971 to October, 1979.

He remained as Ambassador to Moscow until January 1981, when Ronald Reagan was sworn in as President. He will serve on the IBM board's executive committee, with the title of chairman emeritus.

He had the bad luck to move to a new post.

■ David Lyon and Ken Fisch have been recruited to the sales division of Peripheral Hardware Ltd (PHL). Lyon is Northern area manager, with past experience at Burroughs sales team. Fisch joins from CPS Data Systems as sales executive in the Coventry office. Bob Pinn has left NCR to join General Automation as technical support executive and joining the company as software manager is ex-Ferranti man Tony Tucker.

■ Brian Pipe has been appointed managing director of Oceanic. He is replaced as finance division manager by Mike Hall, who previously worked for Oceanic as a leasing executive, and has recently been working for Bank of America Finance Ltd.

■ Dr Christopher Querelle has been appointed principal consultant at Systematics. He is responsible for software package development.

■ Jim Grayson has been appointed general manager of Data Logic's professional services division. He was a director of the company at the beginning of this year and was previously a regional manager within the professional services division.

■ Charles Murray Stuart has become chairman of Baric Computing Services. He is also deputy managing director of Management Computing Services, acquired by Baric's parent companies, Tim Holley, manager of ICL's services group, which includes Baric, Datafile and ICL Education and Training, has also joined the Baric board.

■ Peter Debney, until recently managing director of CSC London, has been appointed to the board of Computer Services Centre Group. He will retain his position as chief executive of CSC bureau operations in the UK.

■ Les Birt has been appointed managing director of Bowthorpe Microsystems. He joins the company from Owners Services Ltd.

■ Malcolm Wright has been appointed director of BIS Software. He joins the company from Robert Bosch.

■ Andrew Rodger has joined Computer Europe as marketing communications manager. He was formerly publicity and public relations manager of Robert Bosch.

■ Graham Thorne has become Honeywell's director of communications succeeding Alan Keen who has retired after 19 years with the company.

## Marconi Fellowship Award

THE seventh Marconi International Fellowship award has been given to Dr Seymour Paper, professor of mathematics and education at the Massachusetts Institute of Technology. He can use the \$25,000 (about £10,000) grant which goes with the fellowship, to originate or complete a project of his choice.

The award was made for the development of a language designed for children, and which has proved useful in the education of children suffering from cerebral palsy, a disability which imposes a massive physical handicap.

A computer education system based on Dr Paper's language Logo encourages a child to take an active role in the learning process. It does this by reversing the usual computer-pupil relationship: instead of the computer teaching the pupil, the child is required to teach the computer.

proved useful in the education of children suffering from cerebral palsy, a disability which imposes a massive physical handicap.

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■ Rick Greengrass has been appointed general manager of Data Logic's professional services division. He was a director of the company at the beginning of this year and was previously a regional manager within the professional services division.

■ Tony Patterson has been appointed sales director of the defence division of Software Sciences. He joins the company from Plessey.

■ Andrew Rodger has joined Computer Europe as marketing communications manager. He was formerly publicity and public relations manager of Robert Bosch.

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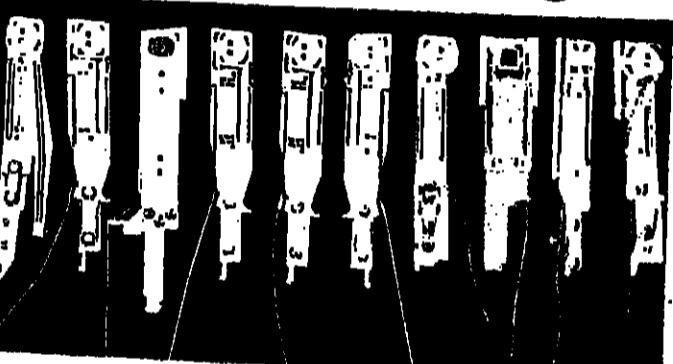
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## 1981 FEATURES PROGRAMME

- 12 March - Graphics
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- 16 April - Communications
- 30 April - Compec Europe Preview/Competition from Abroad

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Full details, specifications and tender documents may be obtained from the County Supplies Officer, County Hall, Guildhall Road, Northampton NN1 1DN (Northampton 34833).

Completed tenders must be received by the County Supplies Officer in the envelope provided by no later than 12 noon, Wednesday, 18th March, 1981.

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# Novel key to hotel safety

A FRESH approach to computer-controlled hotel room security and management has been developed by ARC Ltd, a Watford-based high technology company specialising in microprocessor-based control equipment.

Called Guestkey, the system is claimed to be a comprehensive security and room management system. Incorporating the latest microprocessor technology, it dispenses with conventional keys, Guestkey issue being controlled by a central computer system.

Staff using the system are identified by a personal key and password. All keys issued during their shift are logged by the system, enabling management to carry out spot security checks.

Other vital security features include invalidating all stolen, lost or duplicated keys, detecting unauthorised keys, random key and lock combinations and immediate intruder alarm.

Guestkey does not rely on conventional locks with their tendency to error and has its own independent power back up against mains failure. On the overall hotel management side, its ability to provide room status information gives a complete picture of room availability.

Shifts can be changed at will, enabling hotel staff to be reallocated groups of rooms without the security of the system being compromised.

Because the keys have to be "married" to correct locks and the lock combinations can be changed whenever necessary, issued keys may be taken away by guests as souvenirs of their stay in the hotel.

Cost of the Guestkey System, which includes the computer and print-out equipment, is £160 per room, depending on the size of the installation.

Alternatively, the cost of the system to the hotel on a typical rental agreement can be as low as £170 per room per day.

ARC Ltd (CW) Shakespeare Industrial Estate, Shakespeare Street, Watford, Herts WD2 5HD. Tel: Watford 443000.



*Guestkey's Print-out unit enables the operator to check on individual room and overall security.*

## VDU takes the (eye) strain

AN advanced microprocessor controlled VDU with a 12in screen and IBM-type keyboard, the Aller 1201 incorporates design and styling features to reduce operator fatigue. The possibility of eye strain is reduced by using a green screen phosphor, a clear 12 x 7 character matrix and non-reflective keytops.

Keyboard design includes a separate cluster for entering numeric data, and the scroll feature allows the operator to position the 24-line display "window" anywhere in the 50 lines held in the VDU's memory.

The RS 232 serial interface has switchable transmission rates between 75 and 9600 baud. Split transmission rates are available as an option, as is a 20mA current loop interface.

Full 96 character ASCII sets are available and custom characters or control codes may be added by simple changes.

Aller Services (CW), High Street, Aller, Somerset. Tel: 0458-250414.

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ARC Ltd (CW) Shakespeare Industrial Estate, Shakespeare Street, Watford, Herts WD2 5HD. Tel: Watford 443000.

# Central console for multiplexer

NEW Jersey-based Infotron Systems Corp has added new capabilities to its Supermux 680 Statistical Multiplexer allowing users to communicate with multiple units from a central console.

The console may be used to diagnose problems, transmit messages and receive status reports and the Supermux 680 reduces data communications costs by concentrating up to 32 input lines over a single 9,600 bits per second output.

Statistical techniques enable the microprocessor-controlled unit to transmit only active data inputs, conserving precious bandwidth so that the throughput is double or better than that of conventional multiplexers.

An operator can send a message to any channel in any local or remote Supermux 680 using the new console. User instructions may be transmitted to a remote location and diagnostic test messages may be composed.

Keyboard design includes a separate cluster for entering numeric data, and the scroll feature allows the operator to position the 24-line display "window" anywhere in the 50 lines held in the VDU's memory.

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ports contain quantitative data useful in spotting potential problems and planning system expansion.

The line and buffer utilisation report shows average and peak data rates and buffer use. Error reports describe unusual occurrences and configuration reports show selected programme options and operating parameters for each system channel.

Consoles may be any ASCII-compatible CRT or printer, and are connected to a separate receiving channel interface on collocated Supermux 680 units. They may also be located away from the central console.

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reduction essential. To meet this need, comprehensive facilities are provided.

The system caters for thresholds with dead bands, detection of change, maximum and minimum, mean value and standard deviation.

Data Logging manager, John Shave says, "We realised from the start that such versatility and power could mean involving the user with a programming language unless we designed something unusual. Orion requires no involvement with software. It's all built-in and accessed by a few keys on the front panel."

Solartron has achieved this "soft" keys which interact with the display, the menus being organised to achieve setting up with a minimum of key strokes. This reflects Solartron's philosophy that the best loggers are those which can take measurements with the shortest possible set-up time.

All these functions are organised and controlled by simple front panel keys.

Orion can cope with 200 inputs or up to 600 with extension slaves at high speed which makes data

available for automatic restart after power fail.

In addition, the tape cartridge can give permanent storage that may be loaded immediately when needed.

The cartridge can store 50,000 measurements and is only one of the built-in recorders, the other being a hard copy paper-strip printer.

Interfaces to RS232, RS422 or the GPIB permit external devices to be connected if required.

Solartron points out that Orion is multi-functional. It can interact with a test rig to make measurements and control the rig.

The company believes that product will expand the data logging market beyond the traditional research and test areas. Many industries require equipment to check a process or production line, monitor quality or control environmental tests, day-in day-out without costly labour overheads, says Solartron.

Solartron Electronic Group Ltd (CW), Victoria Road, Farborough, Hants. Tel: 0252 44433.



*The Facit D12 is aimed at the small business market.*

## Multi-role calculator

THE FACIT D12 flexible disc (FD) accounting machine is an office computer developed specifically for small business use which has been designed to cope with all administration routines and is said to combine the roles of accounting machine, calculator, automatic billing machine and computer.

It is easy to use and install, can be placed on a desk and plugged into an ordinary socket and requires no specialist training, says the company.

The D12 can handle continuous forms, separate invoice sets, journal

# VDU is set for the top

CPU Computers of Woking has introduced the Pentland Mark VIII visual display unit which is expected to take over as the top selling model of the range.

The keyboard has five cursor control keys plus a 62-key Qwerty layout and eight auxiliary function keys, 11-key numeric pad and four editing keys.

Visual features include block or underline cursor, steady or reverse video plus protected fields, reverse video and half intensity controls. The Pentland Mark VIII also includes auto line feed and scroll and X-Y cursor addressing.

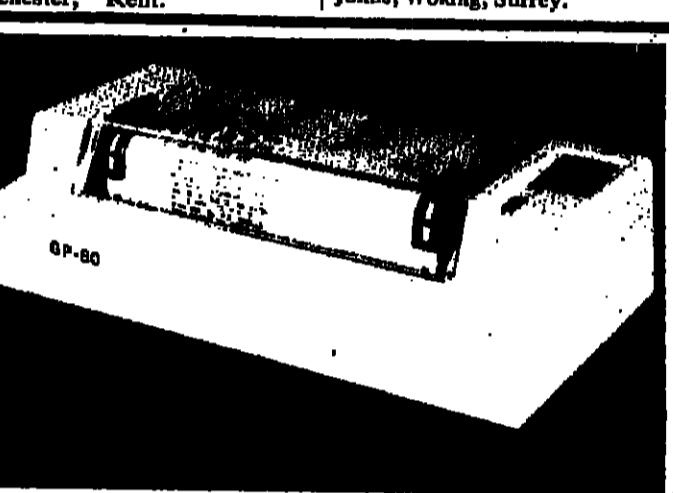
There is a 12 inch screen with capacity for 1,920 characters in 24 lines of 80 characters.

The primary interface is RS232C, V24 with 15 baud rates from 50 to 9,600 baud and a 20-60 mA current loop interface and auxiliary peripheral interfaces are available.

Price of the Pentland VIII starts from £465 according to specification, quantity etc.

Facit (CW), Maidstone Road, Rochester, Kent.

CPU Computers Ltd (CW), St. Johns, Woking, Surrey.



*The GP-80 matrix printer is compact and economical.*

## Low-priced matrix printer has educational appeal

THE GP-80 is a high-performance matrix printer, principally intended for use in the commercial and educational fields.

It is £248 price tag is designed to ensure that the printer receives wide acceptance with the hobbyist and all who need hard copy from their microprocessor systems.

Printing rate is 30 characters per second, with a full 80 columns of 5 x 7 dot matrix format. The standard ASCII 96-character set is provided, with special English and German characters.

Forms up to a maximum eight-inch width may be used and are rear-loaded to an adjustable tractor. An original and two copies may be printed with suitable paper.

It measures 132mm x 172mm x 328mm and weighs 2.5 kg, its dimensions thus providing an additional advantage.

D.A. MacDonald Microprocessor Systems (CW), 3 Holmesland Drive, Botley, Hants. Tel: 0482 81108.

## Financial security device from Racal/Diebold

RACAL-MILGO Inc. of Miami has introduced a device for use with Diebold equipment that will permit financial institutions to share security data and main channel data communications.

Called the Model 911 security interface module or 911/SIM, the product is the first result of last year's co-operative marketing plan involving Diebold and Racal-Milgo, in which financial institutions will be offered a combination of the firm's technologies to reduce data communication costs.

In this case, 911/SIM is incorporated with a variety of Racal-Milgo modems and the Diebold MPS 1020 proprietary security system to permit line sharing.

Operating on the same communications line as main channel asynchronous or synchronous data, the 911/SIM runs at a data rate of 75 bits-per-second in full duplex mode.

It permits line sharing by FSK channel operation apart from main channel operation on the high end of the communications bandwidth.

This separates the low speed security channel data transmission between remote security devices and the central security controller from main channel data transmission.

Unconditioned lines may be used for 911/SIM operations, but either C-2 or C-4 conditioning may be required in some cases.

Significant additional features of 911/SIM include provisions for 24-hour, battery-operated backup to prevent security information from being interrupted even if commercial power fails. There is also a dial backup option to restore service of leased lines full and a loop system option in which security equipment may be polled in IBM 360/370 network environments.

CMOS microprocessor controllers enable all control, decision making and communications functions to be implemented as well as system transparency to the main data communications network.

Racal-Milgo Inc (CW), 8600 N.W. 41st Street, Miami, Florida 33166.

## Alphanumeric system for all-round usage

CHERRY has developed an Interactive Alphanumeric Display System comprising four basic modular components that can be used either individually or collectively as a comprehensive unit.

A self-contained 14-segment, 16/20 character alphanumeric single-line display contains microprocessor-controlled circuitry including drivers, character generator and refresh memory.

Switch-selectable features include full or half duplex, even/odd, or no parity; 5, 6, 7 or 8 data bits per character; 1 and 2 stop bits and 3 switch-selectable baud rates from 110 to 9,600.

Three end-of-line modes are featured and there is left entry with automatic line feed, carriage return, writeover carriage return and horizontal scroll with five brightness levels available to provide a 64x16 range of light output in 4 dB steps.

A fully addressable flashing cursor indicates the next character

position to be written and cursor functions include backspace, tab, selective addressing, end to end of line and erase to start of line.

There are additional standard features like RS-232C, TTL or 20mA loop single power supply operation (12 VDC, 75mA), full I/O buffering, handshake for increased communications speed and full ASCII input.

The solid-state capacitive keyboard was developed specifically for Cherry's Interactive Display Systems and has 66 ASCII-coded keys plus functions for other keys with quick-change clear plastic interchangeable tops.

The specially designed enclosure is in beige aluminium with solid hardwood sides. Besides housing the other modules, space is also available to install additional hardware.

Cherry Electrical Products Ltd (CW), Colchester, Essex, Harpenden, Herts AL5 8UN. Tel: 05827 63100.

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For a personal discussion about these and other opportunities, call Dennis on the number below, or evenings and weekends call Richard on 01-840 1169.

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### RPGII PROGRAMMER

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The ability to work on your own and a team. RPGII or IBM application experience for this IBM System 34 on VME or VMEbus. The experience can either be in production and sales and plant control or in financial systems. Ref. R113.

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Ref. R114  
An experienced computer analyst/programmer with RPG II and two years' analytical experience in a user environment, for system design and development control/purchasing applications. If you can communicate clearly and have production control experience this position is for you. Ref. R114.

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c. £10,000

A relevant degree, supported by a good knowledge of microprocessors and peripherals is required for this position but the main ability will be in managing a large team of hardware engineers. Many of these engineers possess exceptional innovative skills in the field of digital electronics and it is essential that their varying skills are blended to maximum effect.

The person appointed will have direct line responsibility for designing, developing and maintaining hardware implementation schedules for a multi-microprocessor array and its interfaces to a variety of computer peripherals.

The successful candidate is likely to have had several years' hardware development experience in a computing environment with a proven managerial record.

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These senior positions will lead highly competent system software development teams.

Software being developed covers all aspects of operating system and system software including linkers, loaders, debugging aids, monitors, configurators, and file integrity checking routines, together with a wide variety of software tools necessary in the office automation environment.

They will have direct line responsibility for designing, developing and maintaining software implementation schedules.

Candidates are likely to have had over 5 years' experience of software development in a computing environment ideally with a proven software managerial record.

Located in the EAST MIDLANDS, our client offers an excellent remuneration package including a full range of employee benefits with BUPA and generous relocation expenses.

REF: S1/2602

## IBM COBOL PROGRAMMERS

ESSEX

TO £10,000

Our client is a well-known major organisation able to offer a secure future and positive career progression. Due to extensive expansion of the Management Services division they are seeking to recruit experienced IBM COBOL Programmers at all levels.

If you offer more than eighteen months' experience and are looking for a challenge then this is your opportunity. Working in, or leading, a programming project team you will be involved with major IBM hardware utilising CICS and Database facilities.

An excellent starting salary is supported by big-company benefits, and relocation expenses will be paid if necessary.

REF: E1/2602

## SYSTEMS ANALYSTS

WEST LONDON

E NEG.

Our client, a major commercial organisation, is seeking to recruit systems analysts wishing to undertake challenging project work in a highly successful business environment.

Current project work includes the development of teleprocessing systems based upon advanced hardware and candidates can expect to gain valuable new business experience as well as utilising their own background to the best effect.

A sound commercial systems background is required together with business systems appreciation as the role will require the development of systems from initial business feasibility, through design to implementation.

The company offers a package of benefits which one would expect from a successful business operation and this obviously includes relocation assistance where applicable.

REF: NW1/2602

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N. HANTS

£7,500-£11,000

A successful organisation now wishes to appoint several additional Programmers and Analysts in order to complement their development programme resulting from increased business activity.

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The hardware consists of a powerful IBM 4300 machine and utilises some of the most modern software and utilities available in an on-line environment.

Both positions require applicants to have at least two years' in-depth experience of their relevant disciplines and knowledge of financially based systems would be an advantage. Programs are delivered in COBOL and ASSEMBLER and, although CICS is used, training will be provided where necessary.

In addition to the security of a successful organisation, other benefits include pension scheme, annual salary reviews, heating and sports and social facilities. To find out more, ring Myriad on 01-353 0981 quoting reference RS/2602.

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£7,000-£11,500

Our client is seeking additional systems and programming personnel to join and enhance their development teams working on a full range of new systems covering marketing, financial and production applications.

The installation uses IBM hardware with database and on-line systems. Experience of a similar environment will be advantageous although in some positions this is not imperative.

The successful candidates will be offered the opportunity to work in pleasant surroundings in an interesting environment using the latest IBM hardware and software techniques. Career development is encouraged and full technical training will be provided where necessary. Telephone Myriad on 01-353 0981 to discuss these positions in detail.

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Simon Container Machinery Limited is a member company of the Simon Engineering Group and is engaged in the design and manufacture of machinery for use throughout the world in the production of corrugated board and its conversion to printed carton boxes.

Simon have developed computer run centralised systems for these machines. The number of installations is increasing rapidly. We are looking for an engineer of either sex with experience in installation and servicing of such electronic control equipment in industrial applications.

A combination of programming and hardware knowledge plus some tough encounters with industrial environmental realities will be needed by the successful applicant. Experience in working in microprocessor techniques will be useful but not essential.

Extensive foreign travel will be involved. Other conditions of employment include a good Pension Scheme, Life Insurance Cover and other benefits commensurate with a large group of companies.

If this opportunity is of interest to you, please write to:

P. Taylor, Personnel Manager, Simon Container Machinery Limited, P.O. Box 31, Stockport, Cheshire SK3 0RT.

(4462)

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Salary is negotiable, depending on experience. The package includes free BUPA and life assurance cover, assistance with relocation if appropriate. Excellent career prospects within the organisation.

Please contact Sheila Cooke on

Maidenhead (0628) 20207

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# IBM SYSTEM 34

**THE COMPANY**  
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You will be able to work independently with different levels of management and staff and will have a user orientated approach to problems. Other qualities sought are: several years D.P. experience, preferably in a commercial/distribution environment; at least two years' core programming experience ideally on a Wang VS; the ability to train and supervise a small team of trained programmers; some systems analysis experience would also be an advantage.

The career prospects are excellent if you have the ambition, ability and drive to succeed. For further information, do not hesitate to contact:

Mr. Peter Foster, Personnel Manager, Pioneer High Fidelity (GB) Ltd., Iver, Bucks.

Telephone: Iver (0753) 652222

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The North of Scotland Hydro-Electric Board are currently developing a large data-base for Premise + Customer Information to support all Associated Accounting and Engineering Systems. IDMS data-base Software is being used and will operate on our dual ICL 2900 Computer in Aberdeen.

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To control this operating network we wish to appoint two high calibre supervisors to undertake network control and supervisory tasks. The positions offered are Operations Supervisor and Deputy Operations Supervisor. These Supervisors will undertake the responsibility for computer room Operations on all machines, scheduling, operator training and operational efficiency. Alternate weeks on day and

evening shift working will be required.

Applicants should preferably be of graduate standard and while previous supervisory experience in a large on-line environment is essential this may have been gained in a technical support, systems development or computer operations capacity. The essential requirements are in-depth knowledge and experience of large on-line systems using communications and database software, proven man-management skills, and an innovative approach to network operations. Successful applicants who match the above qualifications and who also bring a high degree of personal commitment and a readiness to accept substantial responsibility can look forward to an interesting and secure future.

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# IBM GSD SYSTEM RPG II LONDON - MANCHESTER

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Altergo Business System Limited has vacancies for Programmers, Analysts and Project Leaders to work on its expanding IBM System/34/38 and Series 1 business throughout the U.K. and Europe.

These are long-term career positions which offer responsibility, high financial rewards and the opportunity to extend your skills and experience over a wide variety of applications and systems in the commercial and industrial fields.

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**PROGRAMMERS/ANALYSTS up to £10K plus benefits.**  
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ALTERGO BUSINESS SYSTEMS LIMITED  
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Tel. 01-631 1666

Ruth Berger  
ALTERGO BUSINESS SYSTEMS LIMITED  
Orbita House, Albert Street  
Eccles, Manchester M30.OWL  
Tel. 061-707 4399

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Crusader Insurance Company Limited currently have vacancies in their Data Processing department for experienced personnel. A wide variety of computer systems are controlled by a relatively small team of analysts and programmers, so that each individual can gain a much broader view than in many larger data processing departments.

The company's ICL 2956/10 computer configuration runs under DME/3 but a gradual transition to VME/K will be made. New systems will make use of IDMS and existing systems will be redeveloped to take advantage of new technologies. Our immediate requirements are for:

### SYSTEMS ANALYST to £8,500

This position involves systems analysis, design and implementation, using ICL 1900 or 2900 series of computers for insurance applications. Candidates should have experience of systems analysis and design, and should be aged at least 24 years.

### APPLICATIONS PROGRAMMER to £7,500

Programming using COBOL for insurance applications. A minimum of two years' programming experience with COBOL on ICL 1900/2900 series is essential, with a knowledge of PLAN and/or MAXIMOP an advantage. Candidates should have a good academic background (including at least two GCE A Level passes) and be aged at least 24 years.

### THE BENEFITS

For this interesting and demanding project, additional staff with experience in design or implementation of CO-DASYL type data bases are required, familiarity with ICL VME8, operating environment and terminal application would be additional advantages.

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Lecturer: II 22.012-22.702  
Senior Lecturer:  
0305-211-288

Applications are invited for the above post created to support expanding research and teaching commitment in computer studies at Plymouth Polytechnic.

The successful candidate should further the involvement of the department in mathematics. Applications welcome from persons with a strong background in information systems or in computer related with a particular interest in non-numerical applications of computers.

The successful candidate would be expected to contribute to the research activity of the department.

Applications are invited for the above post created to support expanding research and teaching commitment in computer studies at Plymouth Polytechnic.

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Applications are invited for the above post created to support expanding research and teaching commitment in computer studies at Plymouth Polytechnic.

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Our client, The Gold Division Information Service of ANGLO AMERICA is looking for:

### PROJECT LEADERS, SYSTEMS ANALYSTS, ANALYST/PROGRAMMERS and PROGRAMMERS

with a minimum of four years data processing experience to work in one of the most sophisticated computer installations in South Africa. Situated in the country, they have IBM 370/158 and 3032 main frames (a 3035 is currently being installed), a wide range of mini computers at remote sites and about 400 terminals. They use the latest software tools including IMS database and data communications. Education and training is given top priority and the true data processing professional need not necessarily have a background with IBM equipment. IBM experience is however required for the following further vacancies: TRAINING MANAGER • DATABASE CONTROLLERS, DESIGNERS AND SUPPORT STAFF • SOFTWARE PROGRAMMERS and SHIFTLEADERS (MIN 5 YEARS EXPERIENCE).

South Africa has much to offer—a booming economy, sunshine, low taxation and high living standards. The employment package offered by Anglo American is generous by South African standards and includes • Top salaries plus a car for senior positions • Annual bonuses for permanent staff and end of contract bonuses • Housing at 5% of the basic salary • Allowances for water and electricity • Four or five weeks' leave per annum • Generous relocation assistance • Superb sports and social facilities.

This is an ideal opportunity to combine career progression, experience in a new country and a real possibility of saving.

Final interviews will be held in London at the end of March. For further information please contact Anne Breuer on (01) 454 2698/9 or if you prefer write to her at:

**Prescot Computers Ltd.**  
43 Conduit Street, London W1.

(461)

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**REDIFON**  
COMPUTERS LIMITED

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A Member of the Redifon Group of Companies.

## Data Processing Manager

Systems and Programming c.£9,500

Backed by one of the world's largest engineering organisations, our client is currently making sustained investment to rationalise and develop its manufacturing base. A feature of this programme involves the strengthening of the management support functions and it is for this reason that our client now requires an experienced Systems Analyst to head a small development team in the North-West of England.

From a background in COBOL programming, you will work in close liaison with the parent company's modern hardware environment—IBM 4331 DOS/VSE operating system. Your brief will cover:

Please write enclosing full career details, naming companies to whom we should not forward your application, quoting ref. RPS2, to Ian Lovell, Account Executive, Royds Personnel Services, Royds House, Mandeville Place, London WIM 8AE.

**RPS**  
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## SENIOR PROJECT MANAGER/LEADER AND SYSTEMS ANALYSTS

required with extensive experience in the design and installation of real-time direct data entry business/minicomputer systems using high level languages.

Previous employment of suitable applicants should have been mainly with a supplier of minicomputers.

Minnies are computer system suppliers with installations in City/financial establishments and general commercial companies and have offices in E.C. and Paris. Salary £7,500.

Please send CV to: Sykes Datronics Limited, Regal House, London Road, Twickenham, Middlesex, Telephone: 01-891 4798.

(461)

Mrs K. Marston  
**MINNIE BUSINESS SYSTEMS LIMITED**  
21 Dingley Road, London SE10 8JZ  
Telephone: 01-712 2222

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## EUROPEAN MANAGER

### For International Distributor Network

US manufacturer of floppy disk systems with UK headquarters needs experienced Marketing/Sales Manager—background in mini/computer, peripherals or communications equipment. Applicant needs able European language plus. He will take charge of 12 distributors to support marketing; increase sales and co-ordinate their efforts. Applicant needs good technical background to enable him to support US company; good basic salary plus incentive bonus based on performance each year.

Please send CV to: Sykes Datronics Limited, Regal House, London Road, Twickenham, Middlesex, Telephone: 01-891 4798.

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From nil to No. 1 in Data Entry in just 10 years is proof enough—Redifon means business. Now, with the launch of the R1800 Series and Viewdata PLUS, Redifon certainly does mean BUSINESS. Or, to be exact, it's got to incorporate the electronic office to revolutionise the electronic office to remarkable, "user friendly" Integrated Office System provides many conventional systems can. Plus unique real-time interactive viewdata. Plus IBM 3270 pass through. Plus handprint terminals. Plus text processing. Plus a host of exciting new products for 1981.

The right solution? We're convinced. So are several major companies who have systems already installed and working. Gaining a market first has put us in a very strong position. Consolidating it must be the next priority—and maintaining our impeccable levels of customer service will be crucially important. Which is where you come in.

If you have 2+ years' experience of computer equipment we can offer you full product training at our Crawley headquarters, then total responsibility for your own area.

Pay and conditions are what you would expect of a large, dynamic young company—attractive salaries commensurate with experience plus overtime, plus car, plus realistic expenses.

Your skills could be exactly those we need. Contact John Currey, Manager of our South-East Branch on 01-942 8900 Ext 248. Alternatively, write for an application form to: The Personnel Manager.

Customer Engineers  
Central & S. London  
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## Merseyside Police Computer Unit

A newly created police computer unit serving one of Britain's largest police forces is currently preparing for the implementation of one of the most ambitious and prestigious computer based police systems in Europe. The first phase, due to go live early in 1982, is a real time continuous operation Command and Control System. The hardware consists of a dual Burroughs B5900 large systems configuration with an extensive communications network, and uses database software. The system will be installed in a new purpose built Police Headquarters in Liverpool City Centre.

The successful candidates for both posts will have had experience of two or more of the following:

Burroughs Large Systems  
ALGOL and/or COBOL

Database Software  
Real Time Systems

## Senior Systems Analyst

(Technical Support)  
 (£8379 - £2861 p.a.)

The person appointed to this post will have prime responsibility for the Burroughs standard software and middleware on the system. The successful candidate will be expected to maintain such software; evaluate new software and new releases of software, advise on the relevance to the Force, and, where necessary, ensure that implementation is effected. This system has particularly sophisticated recovery and security facilities and these will be the responsibility of the Technical Support Analyst, who will also be expected to advise on methods of interfacing the system with the Crime and Criminal Information System, on which work has already started.

## Senior Systems Analyst

(Crime and Criminal Information)  
 (£8379 - £2861 p.a.)

The person appointed to this particularly challenging post will work on the design of the second phase - a new comprehensive Crime and Criminal Information System, the first part of which is scheduled to go live in 1984. The detailed user requirement is almost complete and further expertise is now required to take responsibility for the production of the detailed specification, evaluation of proposals for implementation, and to supervise further developments in this field.

Relocation expenses of up to £1,250 will be paid in appropriate circumstances.

For further information telephone  
 Ian Chambers (Computer Manager)  
 on 051-709-8010 extension 8589



Application forms and further particulars available from  
 The Chief Constable, (P.A.A.),  
 Merseyside Police, PO Box 59, LIVERPOOL L68 1JD  
 to whom they should be returned by 13th March, 1981.

## BRITISH COUNCIL FOR AID TO REFUGEES

require a

## COMPUTER OPERATOR

To operate a Commodore PET using information retrieval system. The successful applicant will also be expected, in conjunction with Consultants, to set up procedures covering all aspects of refugee data, expanding computer usage, and establishing security of records. Some assistance with statistics and general office work may be required.

Salary negotiable around £6,000 according to age and experience.

Please send c.v. to the

**PERSONNEL MANAGER**  
**B.C.A.R.**  
**35 GREAT PETER STREET, LONDON, SW1**

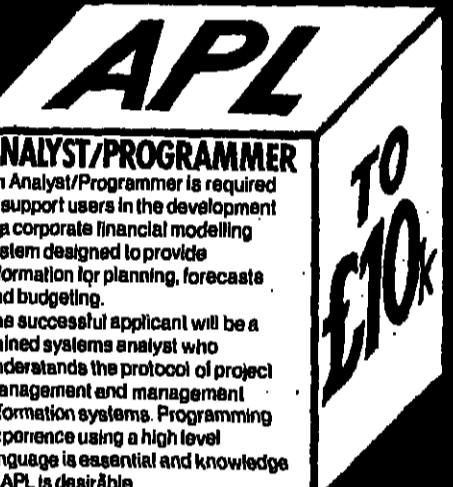
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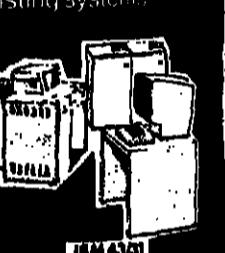
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## FROM DESIGN TO REALITY

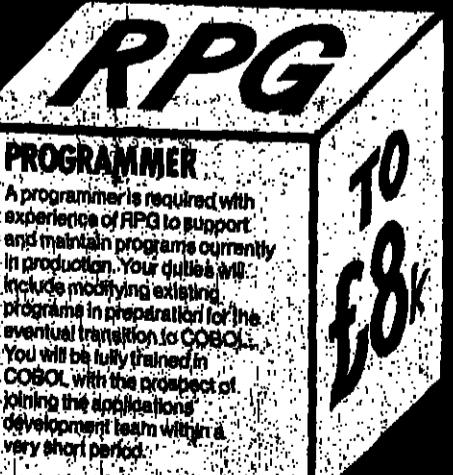


You will be supporting a comprehensive EDP Development Plan which has broad objectives of improving customer service, sales, marketing and management information. To implement the plan several projects are phased over the period commencing with enhancements to existing systems and including total data analysis, investigation into automated office systems and redevelopment of Financial, Sales and Marketing, and Information Systems.



### THE COMPANY

Philip Morris is an international corporation with worldwide revenues in excess of \$4 billion and an impressive growth record. Planned expansion over the next five years will see sales increase fivefold in the U.K. over a wide range of brands including Marlboro and 7 Up. These, of course, are household names but Philip Morris is also the world's second largest brewer and has interests in property, chemicals, paper and packaging which combine to provide a solid platform for growth in the years



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1. Would you like to be involved in working with the latest IBM technology?
2. Do you want to be involved in a company where there is no room for complacency? Then you are the right person for our programme!
3. Our present requirements are for a number of experienced programmers to join our team.

It is essential that you have experience of COBOL and/or PL/I. You will be fully trained in COBOL with the prospect of joining the application development team within a very short period.



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A unique opportunity exists for an Engineer with experience in the C.A.D. field to manage a newly established department of our well-established Engineering organization. The successful applicant will be required to develop and manage these facilities to meet the needs of our clients in the areas of Design Engineers and also the International market. This is a Senior Staff appointment and consequently the salary reflects the importance of this appointment.

Confidential applications to:

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Telephone 081-941 1737

One/two-year contracts.

Free accommodation, travel, recreation facilities.

Tax-free salary.

Single status staff preferable but not essential.

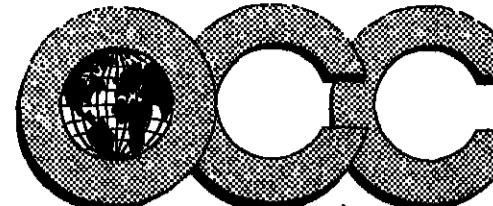
U.K.-based staff with Middle East travel are also required.

£7,000 to £12,000 p.a.

Send a summary of your experience to:

Alan W. Thomas

SIRO (SYSTEMS INFORMATICS)  
52 Kilmore Road, Caversham, Reading RG4 7LX



## Nantwich

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OCC Computer Personnel  
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0270 627 206

## Honeywell Systems Brussels

A well-known multi-national with its European headquarters in the Belgian capital wishes to recruit a number of specialists in Honeywell systems and software - particularly Level 6 and TDS/IDS for permanent placement at a new R & D division specialising in production control packages. Ref: 28/1 Brian Harris

## Software Engineers Warwickshire

A world leading supplier of remote supervisory control systems involved in turnkey projects in telemetry and process control needs software engineers with exposure to DEC PDP11 under RSX11M with either MACRO II, FORTRAN or RTL2. Alternatively those with exposure to microprocessor-based industrial systems. Ref: 28/2 Brian Harris

## Systems Programmers to £15,000

France, Belgium, Germany, Kuwait tax free

We have a number of IBM clients in Europe and the Middle East who wish to recruit systems programmers for permanent positions. Installations include 4341, 370/148 & 370/158. There are requirements for both DOS/VSE and OS/MVS experienced candidates, and excellent packages and career opportunities are offered. Ref: 28/3 Neville John

## Senior Systems Analyst to £9,000

Liverpool

If you have been in DP for at least four years with systems analysis and design experience on any hardware, in accounting and financial areas (costing, payroll etc), our international client offers a rewarding career with job interest, security, new technology (latest mainframe, DB, TP) and excellent benefits. A major computerisation project is under way. Ref: 28/4 Olga Penn

## Analyst/Programmers to £7,500

Merseyside

Two analyst/programmers are required by the UK subsidiary of a large American company, to complete the team engaged in the development of improved information systems. The hardware is a 4mb 4341 (DOS/VSE). You should have at least 18 months' experience in IBM Cobol and possibly some Assembler and 12 months in systems. The applications are mainly financial. Assistance with relocation. Ref: 28/5 Olga Penn

## R.T. Specialist to £9,000/DM60,000

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For a major German Industrial group - an outstanding opportunity for a young R.T. specialist, preferably single, to spend a year in Germany studying the company's systems and software and German, returning to England as the company's English Specialist. Further opportunities for European travel later. Ref: 28/6 Brian Harris

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148 Walling Street, Radlett,  
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£6,000-£12,000 + Car

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We have vacancies in most areas with requirements particularly in mini-computer systems, peripherals, and communications. We need to know your background in order to help you, so register with us now.

## TECHNICAL EDITOR

### 10 Month Assignment (Bucks) £9,500

CSC requires an experienced Technical Editor to work on a (military) project from April 1981 to January 1982. The Editor will collate, condense and standardise material generated by a large project team to produce comprehensive user reports.

Minimum requirements: five years relevant experience with complex computer-based information systems; knowledge of word processing techniques and the ability to adjust to CSC's control procedures.

Contact: Andy Wright or Mike Creamer

## MIDDLE EAST Health Care Computing

SIRO has an established reputation in the Middle East for the successful development and implementation of advanced health care computer systems over the past three years. We are expanding our project teams at a number of locations and we have opportunities available at senior and middle levels.

### ANALYST/PROGRAMMERS

COBOL, database, and TP experience. Hewlett Packard, Honeywell, Control Data, and minicomputer knowledge desirable but not essential.

### SOFTWARE SYSTEMS PROGRAMMERS

Experience required of HP 3000 DS, MTS, MPE internals.

### HARDWARE ENGINEERS

Experience required of routine maintenance, fault location, repair of minicomputers, peripherals, and data communication equipment.

### SENIOR COMPUTER OPERATORS

Sound experience and established responsibility required.

£11,000 to £20,000 per annum

One/two-year contracts.

Free accommodation, travel, recreation facilities.

Tax-free salary.

Single status staff preferable but not essential.

U.K.-based staff with Middle East travel are also required.

£7,000 to £12,000 p.a.

Send a summary of your experience to:

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52 Kilmore Road, Caversham, Reading RG4 7LX

# Office of the future is on its way — but salesmen of the future are needed now

by Alan Simpson

SALESMEN are increasingly regarded as being in the front line of the company attack. They are also the last line of company defence, particularly when personnel cutbacks are taking place.

The recognition that selling is the most important part of any business activity has only recently been accepted in the UK. That computing has had a large part in changing selling attitudes can be traced to the large number of US companies operating in the European marketplace.

However, getting into computing, at least for those on the outside, almost at any level, seems as difficult as microchip technology or satellite communication channels.

But with a current vacancy level of 50,000 in data processing, and increasing daily, the industry offers much recruitment scope, not least to salesmen. Many computer organisations, particularly those involved in selling software packages and the flourishing PCM-QEM organisations, are complaining to anyone who will listen that their European growth and development plans are being hampered by lack of sales recruits.

Those not closely involved in the industry might be confused from believing that most growth is taking place in micro and word processing units. This is not the case. As the recently established recruitment company, Michael Drayton reports: 'The demand

**A successful salesman should not have to wait long for internal recognition or for a rival company to come knocking with promising opportunities. There is certainly no shortage of computing companies starting up operations in Europe.**

method of reducing clerical costs, improving customer services and supplying up-to-date management information.

There is, unfortunately, no open door policy into computer selling. For a start, there would be just too many doors. Selling can involve software; computer software packages are now being actively promoted and a large number of US companies are setting

events. Already there appear to be signs of a considerable pick-up in demand. The recession, far from harming computer sales, often serves as a bonus factor. Increasingly, companies are having to purchase or enhance computer systems as a

up selling organisations in Europe.

Hardware can range from a small-scale business or personal computer, a minicomputer system or a full-scale mainframe equipment. In between are all manner of peripherals such as printers and data preparation equipment as well as terminals, computer room environment systems and data communication products.

Earlier computing generations featured sales teams largely recruited from the universities. Graduates recognised the challenge and potential offered by the computer industry and climbed aboard the IBM, Burroughs, Honeywell or NCR bandwagons. Other salesmen "graduated" into full-scale computing via adding or accounting machine organisations. Some user personnel at the same time saw the sales opportunities (and rewards) and moved over into selling, as did many systems analysts and programmers. Even some service engineers crossed the lines to selling.

Decision often plays an important part in sales recruitment. The sales manager is possibly uncertain whether he can justify additional sales recruits, and the salesman uncertain whether he should risk

Not all salesmen are whiter than white. Some are a deeper shade of grey who pack in their work cases a large quantity of wool which will hopefully cover customers' eyes.

seen not so much as a means of processing large amounts of data, but more as a total service and involvement in company affairs.

The salesman must therefore be self-confident, capable of communicating with all levels of company management and personnel, with an ability to diagnose problems and present cost-effective solutions.

Computing itself being largely a free enterprise concern, the salesman must show similar degrees of effort, achievement and self-motivation. Other major attributes must include enthusiasm, intelligence, plus a basic understanding of technology and what it can offer business.

This understanding can easily be assisted by a degree in technology, business management or a related qualification. A sales job in telecommunications or perhaps engineering graphics or design, could pave the way to that initial computing foothold.

Having got into computing sales, the only direction should be up. Good news spreads fast, and a successful salesman should not have to wait long for internal recognition or for a rival company to come knocking with promising opportunities.

There is certainly no shortage of computing companies in Europe, each one seeking experienced and professional salesmen.

As Alan Williams recently pointed out from the safety of the back pages of Computer Weekly, the failure to recruit new sales personnel is a direct factor in lost revenues and sales.

In the past, a sales career in computing involved a substantial measure of pioneering and make-do-and-mending. Requirements today call for a more professional approach. An understanding of business methods embracing manufacturing, commerce and finance, is essential. Computing is now

leaving his current company.

But not all salesmen are whiter than white. Some are a deeper shade of grey who pack in their work cases a large quantity of wool which will hopefully cover customers' eyes. Bluffing (or perhaps bluffing) the customer with super-hype jargon still takes place, particularly in the microcomputer software market. The Institute of Data Processing Management has now declared open hostilities against such activities and could attempt to draw up a code of good selling conduct.

Of the three main methods,

of job recruiting, advertising is probably the first to be considered. Positive factors include a pre-determined contact, a wide catchment net and some related company promotion. Drawbacks in the amount of sifting required and the information the opposition may have gleaned from the advertisement.

The main benefit of using a recruitment agency is that of time-saving both in preparing advertising, copy and subsequent selection procedures. In either case, firm job specifications are essential for all parties.

The third method, that of

direct approach, is normally

restricted to very senior ap-

pointments or selected indi-

viduals. Casual sales posting

encounters often take place

such industry gatherings, ex-

hibitions and conferences.

The Office of the Future

may be round the next corner.

But the demand for salesmen

of the future is taking place

right now.

## SALES RECRUITMENT ADVERTISING FEATURE

*As a newly formed Midlands Specialist Bureau we are currently seeking*

## Two Sales Consultants MIDLANDS BASED TARGET EARNINGS

# £20,000

+ PRESTIGIOUS 2 LITRE COMPANY CAR

+ BUPA

+ EXCEPTIONAL EXPENSE PACKAGE

+ RELOCATION (IF REQUIRED)



Specialist Computer Recruitment Ltd

## THE COMPANY

As part of an International Management Consultancy, we are about to enter the Bureau market place having gained well appointed offices, technical staff and hardware, to sell our services to high technology areas.

The intention is to offer a comparatively unique range of services at the top end of the market place, whereby we will be looking to mirror our Parent Company's unrivalled success and growth within its own environment of Management Consultancy and computer hardware sales.

As a Group, we currently employ around 100 personnel, consisting mainly of Consultants, Computer Systems and Programming Staff, with a variety of backgrounds mainly within the Manufacturing industry although other areas of specialisation are Finance and Production.

Our Company has been formed to provide a total Consultancy computer service to our Organisation's needs, whatever the size.

## THE CANDIDATE

The position will appeal to a successful bureau Salesman with the skill and determination to build up a Client base within the Midland region. The Candidates must also have a natural business flair coupled with a successful sales record and knowledge of the current bureau industry. As this is a "start-up" situation it is imperative the Candidates should have a good working relationship with Computer Users in and around the Midlands area.

## REMUNERATION

Basic salary in excess of £8,000 will be paid together with a guarantee facility and commission earnings. Although at this stage the package as a whole is hard to define, an income of not less than £20,000 would be available for the right person. A Company Car, BUPA, Pension Scheme and an attractive expenses package will also be available to the suitable candidates.

For further details, please telephone, in the first instance, our Advising Consultant, PAUL PEARCE  
ON 021-236 3781 (24 hour answering service)  
OR 021-308 4908 (evenings and weekends)  
If you prefer Curriculum Vitae would also be welcome.

London 01-835 0671 3 Mandeville Place, Wigmore Street, London W1M 6LB.  
Birmingham 021-236 3781 36-37 Great Charles Street, Queensway, Birmingham B3 3JY.  
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA.  
Brussels 010 322-640 7151/71 Avenue Louise 327, Boite 4, 1050 Brussels.  
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## Computer Professional Recruitment Consultancy

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If you have had at least two successful years with one of the handful of prestigious Word Processing Companies in the U.K. today, then we would like to meet you.

We want the opportunity to discuss a future with our Clients, an American market leader in stand-alone and shared resource Word Processing Systems.

They are prepared to 'front' a good income with excellent potential to earn substantially more selling a comprehensive range of first-class W.P. Systems.

Contact BOB BOWER, ADVISING DIRECTOR, quoting refer-

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**Hutton**  
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## SALESPEOPLE & SYSTEMS ENGINEERS IBM SYSTEM SOFTWARE U.K. (BERKSHIRE) & OVERSEAS 5 FIGURE SALARY

These challenging new opportunities are with a progressive, world-wide organisation specialising in the development and marketing of a comprehensive range of IBM compatible software products.

## SALESPEOPLE

For positions in U.K., FRANCE, GERMANY, HOLLAND and SWITZERLAND.

Applicants must have a proven track record in selling, preferably in computer software, although this is not mandatory.

A systems programming background in a DOS and/or OS commercial environment and fluency in either French or German is preferred.

The above-mentioned positions are unique opportunities to grow with an expanding and successful international software group who can offer the following just rewards:

- \* FIVE FIGURE SALARY
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- \* RELOCATIONS ASSISTANCE
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## Sales Engineers

Incomes well into the 5-figure bracket.

Now established as a permanent feature of Britain's data communications scene, Codex (U.K.) is expanding its existing sales team to cope with increasing demand for Codex-bred know-how and products.

In its field, the Company is a world leader, marketing a comprehensive integrated range of products from modems through to distributed communications processors based on the latest technology.

The Sales Engineers appointed will advise prospects on enhancing existing systems and developing new ones, and will sell the products required to implement their recommendations.

Successful selling experience, either in data communications or in related fields

such as telecommunications and computer peripherals, is essential. Field and in-house familiarisation training will be provided, as necessary. Vital attributes are determination, get-up-and-go, attention to detail and a thoroughly professional attitude.

Salary plus commission produce on-quota earnings of £14k. The Company also provides a car, free BUPA life assurance, income continuation plan and non-contributory pension scheme - plus relocation assistance, where necessary.

For an application form, telephone or write to Sue Sewell at Codex (U.K.) Limited, 105/107 Landsdowne Road, Croydon CR0 2BN, Telephone: 01-680 8507.

**Codex**  
WELL GET YOU THROUGH  
Codex (UK) Limited is a subsidiary of **MOTOROLA LTD.**

### Exciting Opportunities in Computer Field Service

Our client, part of a major international group, designs, markets and provides technical field service for all aspects of telecommunications and data processing equipment - including sophisticated minicomputer systems. Opportunities now exist for high quality field service engineering personnel to join the company and embark upon careers which provide unusually wide and interesting experience with the latest high-technology computer and communications systems. The company will offer a competitive salary, company car and those benefits associated with a successful international organisation - including personal development and training.

### Field Service Engineers Leeds and Maidenhead

The need is for executives who have sound experience in providing technical field service to disk-based mini-computer installations, preferably in a remote terminal/telecommunications environment. Experience with Data General or DEC equipment would be beneficial.

### Senior Field Service Engineer Birmingham

In addition to the technical experience described above, applicants for this position must have the leadership qualities and maturity to enable early promotion to a full supervisory role for a team of Field Service Engineers.

Applicants should telephone Garry Meakin at PDL for further details.

**PDL** PETERSON DAVIDSON LTD  
Heron House 19 Marylebone Road  
London NW1 Tel: 01-486 8991

### BOX NUMBERS

Box number replies should be addressed to:

Box Number  
s/o Computer Weekly  
Dorset House  
Stamford Street  
London SE1 9LU

### SALES PROFESSIONALS

VERY HIGH BASIC - 2-LITRE CAR  
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Good prospects for early promotion

Our client will be interested in talking with you if you have a successful selling record and a working knowledge of one or more of the following:

Commercial Applications  
Distributive Processing Systems  
Communications  
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Key to Disc

In return you will be offered the opportunity to use your professional skills in an exciting environment with unlimited earning potential. In the first instance telephone Camberley (0276) 32898 (office hours) or Farnborough (0262) 516978 to 10 p.m.

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computer people rely on

### Sales Executives

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Success in the computer industry means being known for both innovation and service.

In an area of rapidly advancing technology it takes a special commitment to maintain that kind of success. The company is investing confidently in its future following record sales and profits in 1980. This is a reflection of the excellent market acceptance of their new superminicomputer which by virtue of the increased capability, speed and cost performance can outperform many mainframes.

With over half of their development resources devoted to software, the need is now for experienced computer sales executives. With either a commercial or technical background you would be attracted to a professional goal-orientated company that can make the fullest use of your abilities and provide a career path with choices. In the first instance, telephone Dick Glazebrook on 01-405 0442. Or send a brief CV for his attention to: High Holborn House, 49-51 Bedford Row, London WC1V 6RJ. Any approach will be treated in strictest confidence.

**MP**  
Michael Page Partnership  
Recruitment Consultants  
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# THE BRITISH ARE COMING! NEW ENGLAND. USA.

Our clients, the Paul Revere Group of Companies, are one of the leading financial/insurance organisations in the U.S.A. Established in 1895 they rank today in the top five per cent of the country's life insurance companies. These permanent career positions are located at their Worcester, Mass., headquarters where they utilise IBM 370/158 and 148 hardware under DOS/VSE, using CICS, CMS, DMS and Mark IV. Cobol is the main language and all work will be on the development of new on-line applications.

### SENIOR ANALYST PROGRAMMERS

A minimum of four years' D.P. experience is required with fluency in at least two programming languages with an understanding of DOS and JCL. Preference will be given to candidates with IBM experience, but this is not essential.

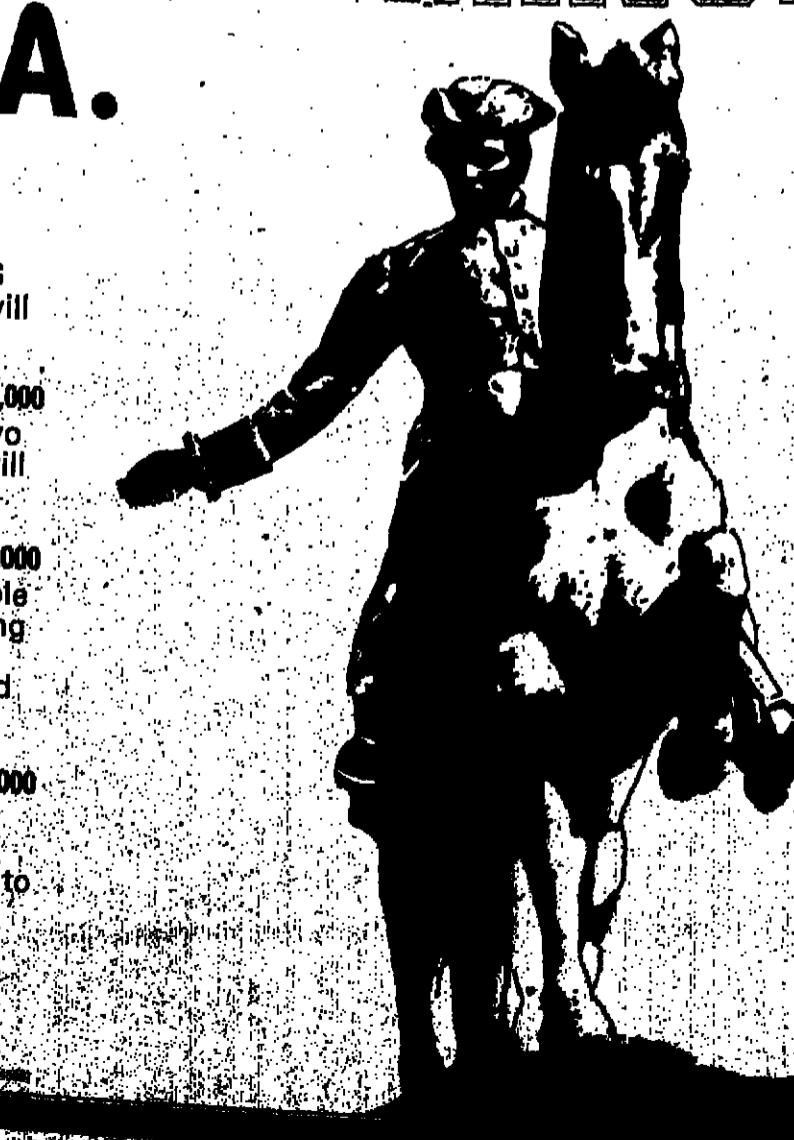
### PROJECT LEADERS

A minimum of six years' D.P. experience is required and candidates must be able to demonstrate the ability to provide project leadership support. A programming experience of CICS, CMS or DMS. A knowledge of insurance applications would be ideal, but this is not essential.

### SENIOR SYSTEMS PROGRAMMER

A minimum of two years as a Systems Programmer is required and candidates must have a thorough knowledge of basic Assembler and systems internals (MVS, CICS, etc.). The successful candidate will have the experience and ability to build an MVS system, generate the operating system and install/maintain using SMP and analyse system dumps with IBM TSO.

Our clients will be interviewing for these positions in mid-March so please telephone immediately or write to E. J. Rhodes Associates, c/o CRS, 16 Buckingham Palace Road, London, S.W.1. Telephone number 01-828 1384.



# DALROTH computer personnel GERMANY SOFTWARE ARCHITECTS

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Dietz is a leading West German mini computer manufacturer who currently wish to define the architecture for a new hardware range. The Company is based at Mulheim, which is a pleasant rural location in the Dusseldorf area.

The system will be based on a high-level object orientated multi-micro-processor architecture and will include special purpose peripheral attachments that will match the sophistication of the mainframe system. The following personnel are required:

### Operating Systems Specialists

Ideally candidates will have a minimum of 7 years' experience including file store organisation, task management, virtual memory management, etc, and/or high-level job management interfaces both at the hardware and software levels.

### Compiler Specialists

This is a special assignment involving the design and implementation of a compiler porting system for the new range architecture. There will be a very close working relationship with the Operating Systems team. Ideally candidates will have extensive compiler design and run-time environment experience.

Opportunities exist for travel within Europe and also to the USA. German would be useful although this is not essential. Candidates with similar or related software backgrounds are also invited to apply as additional software personnel will be required for development and implementation later this year.

An attractive relocation and benefits package will be offered with these appointments.

For further information please contact Roger Allington on 01-493 2947 (office) or Berkhamsted (04427) 2299, evenings/weekends. Please quote Ref. CW9848/1.

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CAN YOU offer experience in Software Design for R/T processing?

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If the answers to any of the above questions are YES, we want to hear from you.

Digital Applications International is an established consultancy with a reputation for excellence in the application of mini and micro computers to real time processes. The Company has offices in London, Manchester and Frankfurt a.M. We are seeking people with sound experience and preferably a degree. Some work may involve travel to foreign parts, particularly in Western Industrialised countries. Salary dependent on what you have to offer, but in U.K. around £10,000 plus profit sharing and other benefits.

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DAI

### MINIS HERTS

Programmers well versed in Mini Assembler and preferably with some knowledge of COBOL, required by Manufacturer of key-to-disk, database management, and distributed processing systems. Some telecomm experience also appreciated.

£6.5-9K

### PL/1 EUROPE

Swiss and Dutch opportunities for Programmer/Analyst and Programmer with considerable PL/I experience (minimum 3 years). Some knowledge of IP and DB systems would be an advantage. Relocation assistance offered.

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### MICROS BUCKS

Software Engineers with prior experience wanted by specialist department of Data Communications equipment. Positions technically oriented, requiring real-time Assembler knowledge for production of communications controllers.

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### TECHNICAL ADVISERS

Technically-oriented Consultants/Advisers with 5-10 years' direct involvement in communications, networks, office automation, Viedata or related fields required by leading London Consultancy. Candidates must combine a professional and presentable image with excellent technical skills. Some positions offer company cars, other substantial benefits.

to £15K

### GERMANY / PDP11 & RSX11-M

Software Engineers with real-time PDP11 or LSI 11 Assembler experience (minimum 4 years), wanted to join programming teams working on the development of industrial measurement and process control systems for leading supplier in this field. Excellent relocation offered to pleasant RhineLand location.

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### COBOL MIDDX

Analyst/Programmers with at least two years' commercial user experience and a solid training in COBOL are needed for new product development projects at our Client's Middx. offices. Degree or equivalent preferred.

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### CAD S/W ENG.

Software Engineers and Designers with experience of CAD and technical software on DEC. Prime or similar, with Fortran/Assembler, wanted for research development work being undertaken by this East Anglia Establishment.

£8K

### COMMS SOFTWARE

Designers and Programmers wanted by British-based supplier of Comms Systems. Expertise in X25, operating systems, Pascal and Assembler urgently required for new and existing teams.

£7-11K

### MINI & MICRO HOLLAND

Systems Designers, Analysis and Programmers, Assembler and real-time experience essential wanted by Dutch firm specialising in control systems. Electronic/Electrical Engineering background an advantage, experience preferred is DEC, DG, Philips or Intel, though other considered. Medical insurance, relocation, etc. provided.

£11-17K

### IBM HERTS

Programmers, Systems Programmers and Analysts with COBOL or Assembler programming background, and for more senior positions, specialist knowledge of IMS, TSO, SP, MVS, Datamanager or similar urgently sought to join teams developing highly sophisticated and complex commercial systems for our forward-thinking client.

Up to £14K

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01 373 3063

### SENIOR PROGRAMMERS

2-3 years COBOL  
Circa £9,000 + benefits  
West London

Our client, a successful retail organisation, requires two experienced COBOL Programmers to work on the development of a major new system.

Utilising a 2904 backed by a 2946, candidates with 2-3 years' experience, preferably on ICL equipment, will be responsible for a team of programmers engaged in the new development work.

The company is committed to producing new systems using advanced techniques and applicants should have knowledge of Range COBOL, TPS, MTS, and PROSPER although full training will be given where necessary.

For further details —

Contact Mike Mauder on 01-235 9891 or on 04747 6558 evenings and weekends.

Ref 06/08

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A highly successful well-established UK based American bureau is rapidly expanding through a major investment program, already noticeable in its very strong new managerial team.

The successful Engineering package salesman will join a company offering proven excellent products in the field of Structural Engineering (covering Inshores and offshore structures) and in Finite Element Techniques using CYBER computers. The commercial bureau has a wide range of clients. The market places a number of standard and unique commercial packages which will sell well. Good earnings (C18K+) should be achieved within year. This company offers a 2-litre car plus free BUPA and free Life Assurance in addition to other top company benefits, so apply now.

CW9/1. Michael

DATA COMMUNICATION SALES MEN  
MESSAGE SWITCHING SALES MEN

W. MIDLANDS & S.E. ENGLAND TO £18,000 + CAR

One of the U.K. market leaders in communications hardware with a turnover of £12 million last year is expanding fast. It now requires five more salesmen to meet market requirements for their very successful products of modems, multiprocessors, network analysers and message switching systems (the message switching salesman should live in the Western Home Counties). All their salesmen reached CUITA LAST YEAR so apply now and enjoy a truly successful career.

CW9/2. Michael

IBM SYSTEMS PROGRAMMERS

MIDLANDS & HOME COUNTIES £8,000 TO £11,000  
I bet you never knew how popular you were? All you need to have is a technical IBM background with relevant IBM DOS/VSE, OS/VSE or MVS experience to command a very good salary. We now have vacancies in E. LONDON, N. LONDON, NW1, NORTHAMPTON, HANTS, CROYDON, KENT and the CITY. Remember that good applications programmers with the right interest in the systems side would be very welcome. Several companies offer excellent perks including relocation, package, subs, mortgage, etc.

CW9/3. Tricia

SENIOR COBOL PROGRAMMER

SURREY TO £10,000  
A major food manufacturing company requires a Senior Programmer with 2 years' + COBOL experience. Their installation is ICL large 2900 under VMEB. You can expect the usual large company benefits in addition to a generous salary for the right person.

CW9/4. Tricia

ANALYST PROGRAMMER

W. LONDON TO £9,000  
If you have two years' + COBOL programming experience with some analysis, preferably with knowledge of CICS, DB and DOS, then ring now for more details of the above position. This pharmaceutical company has recently installed the latest IBM 4380 machine. Benefits offered are excellent, including free meals and free BUPA.

CW9/5. Tricia

RPGII PROGRAMMERS/  
ANALYST PROGRAMMERS

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We have at least 12 current RPGII vacancies in the London/Home Counties areas, so if you have two years or more RPGII experience ring us for details of these positions and their locations. Hardware includes IBM Sys. 34, 38 and 4341, and perks could include relocation assistance and European travel.

CW9/6. Tricia

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A major international chemical company requires a Project Leader with at least five years' DP background. The applicant will have experience of leading a project and of on-line systems design. Involvement with DATA-BASE, CICS and DL1 are advantageous. There are the usual large-company benefits which are excellent.

CW9/7. Patricia

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CROYDON TO £8,200  
A large installation with wide company benefits requires an operator with two years' experience of MVS JES2 & OS/VS2 to operate their IBM 370/168.

CW9/8. Simon

OPERATORS

CHELMSFORD TO £8,000  
A new installation in Essex with IBM 3032 machines requires an operator with two years' experience with OS/VS1 & MVS. Company benefits include subsidised facilities for family bonus.

CW9/9. Simon

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TO £450 PER WEEK  
IBM PL/1 DC9, RPG11 SYS 3,  
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CW9/10. Irene for details

**UCA**

Recruitment Consultants  
Universal Computer Associates Limited  
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# GROUP COMPUTER MANAGER

Top salary + car

East Midlands

After expanding rapidly over recent years, we now wish to develop our data processing functions by the creation of a group computer service to operating companies.

We are looking for somebody who is capable of identifying our management needs, specifying equipment and other resources, designing and installing computerised systems on a common user basis throughout the group. Successful applicants must have considerable experience in all aspects of DP management and will probably have also had experience with systems programming with a background in a medium-sized manufacturing environment. A broad knowledge of different computer manufacturers and configurations with experience of distributor data processing, remote links and on-line systems would be a distinct advantage.



This is a senior level appointment responding to the Group Financial Director and an excellent remuneration package with fringe benefits is available to the right candidate. Full details of career and experience to date should be sent to: Mr. Robert Ashurst, Group Personnel Manager, Stag Furniture Holdings Limited, Haydn Road, Nottingham NG5 1DU.

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# FOR A TOP JOB IN DATA PROCESSING YOU ONLY HAVE TO KNOW WHO TO ASK!

Ever had the feeling that your career is slipping from under you? (No doubt you put it down to the current ice-age of recession.) Well, in one deft move, you could find yourself back in an environment of certainty, growth - and future. You could also find yourself earning up to £15,000, and a car!

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The Company began operating in 1971, and by the end of that year assets totalled around £30 million. From the start, we were totally committed to computerised systems.

Result in 1981:

Hambro Life is the largest unit-linked assurance company in the U.K., with assets in excess of £1.1 billion. In fact, in 1980 we notched up a phenomenal growth in assets of 28%.

Our integrated systems have now entered Phase 3, while the current configuration is a 3033N (4MB) and a 3031.

From this you may assume that our Data Processing Division is very large, very exciting, full of career potential - right to the top. Your progress and rewards are based on your performance. The company itself is young with an average age of 28 in the Programming Department.

So if that gives you some idea of why Hambro Life is the company to work for, we can now move on to your job.

We need to expand our technology biased areas with talented people who have a proven track record of excellence and potential to grow.

For full details and an application form, either send the relevant coupon to Anita Meech, of Hambro Life Assurance Limited, Hambro Life Centre, Station Road, Swindon, Wiltshire or call her on Swindon (0793) 27812 (24 hour Ansaphone service).

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DESIGNING COMPUTER  
SYSTEMS AND I'M ASKING...

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**Cheshire**

Systems Programmer  
Up to Circa £10,000  
Chester

Cheshire County Council run a 6MB IBM 3031 with a large terminal network under OS/VS1. We are about to convert to MVS and are looking for a Systems Programmer with at least one year's experience in an MVS installation. Experience in CICS/TAM/NCP would be an advantage.

Salary is negotiable and will depend upon experience. The Council also offers an attractive relocation package with the possibility of short-term housing to rent. A flexible system is operated and there are excellent sports and social facilities provided by the Council.

The vacancy is at County Hall, Chester which is one of the most attractive cities in the country and provides easy access to the North Wales beaches and countryside.

Please send your CV to: Mrs Sue Wade on Chester B02141 for application form or alternatively write to:

Systems Control Section  
Management Services Department,  
Cheshire County Council,  
County Hall, Chester, CH1 1TB

44609

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We seek SOFTWARE DESIGNER/TEAM LEADER to make significant contributions to the design and implementation of a transaction processing and communication system. The assignments are for a minimum of 1 year in Scandinavia in an excellent working environment. You will be working with, and possibly leading, both young and dynamic designers for an important state-of-the-art project in association with a European-wide consortium.

REMUNERATION: £11K-£15K (according to position and experience) plus attractive total expenses package.

QUALIFICATIONS: Minimum of 5 years' computing experience including on-line multi-processor mini-computer systems. You must have a proven record of success in design. Knowledge of PASCAL and message switching will be an advantage.

For further information contact Richard Gordon

COINTECH SYSTEMS LIMITED

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Tel: 01-526 7244

44610

**Systems Analysts**  
£12-£15,000 p.a.

Long-term contract positions  
North London location

DATA FOR GW project: INTEL 8086 (imulsion  
disk), CO-processor, 640K memory, 10M disk

CONSULTANT: PASCAL, COBOL, FORTRAN,  
C, C++, CLOS, LISP, PROLOG, Smalltalk, C++, CLOS

DATA FOR CONSULTANT: PASCAL, COBOL,  
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All classified copy should reach our offices no later than 3.30 p.m. on the Monday preceding Thursday's publication.

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Excellent benefits apply.

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A major organisation who are sole distributors of a leading minicomputer  
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is 10% of gross sales produced amounting to £200,000 of business. There are excellent prospects for advancement to management level within the  
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Usual benefits apply.

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**BUREAU SALESMAN**

Middlesex c. £11,000 +  
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Our clients, a large commercial Bureau are currently recruiting experienced  
sales people. Ideally you should have sales experience in a computer manufacturer, however applicants who have a proven track record  
in other areas, particularly programme calculations or input computing  
will also be considered. The position will involve a choice of dealing with standard packages or custom built systems. The territories to be  
selected are London and the Home Counties.

Excellent company benefits are offered.

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**OPERATIONS**

Bury c. £9,000 +  
Our clients are seeking an operator with address file management experience  
to work with a basic knowledge of teleprocessing applications. They require a person for relocation and, among the many attractive  
benefits offered are 25 days annual holiday.

Ref. BC4626

**OPERATOR**

Essex c. £9,000 +  
Our clients, a well known consumer organisation have recently transferred their  
first IBM mainframe and are now seeking operators to work 1 year's experience  
of OS/VS/3. The site operates a two-shift rota and future promotion  
opportunities are available. A profit share scheme is also offered.

Ref. BC4626

**OPERATOR**

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A well known company in Essex require operators with at least one year's IBM  
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Fringe benefits include free meals, non-contributory pension scheme,  
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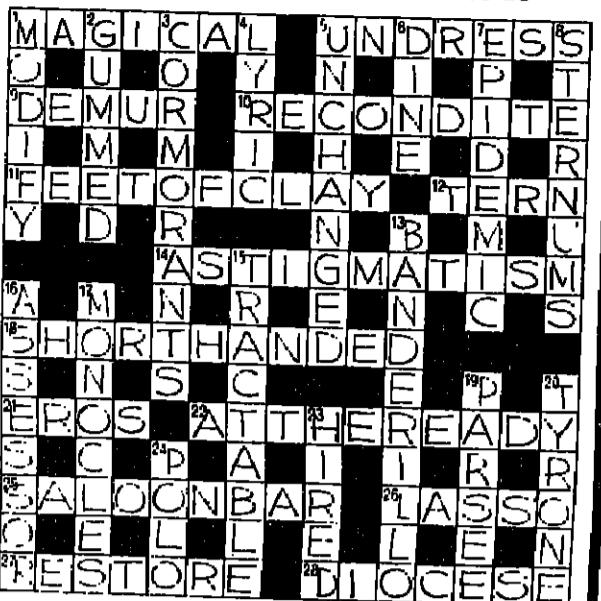
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**OPERATOR**

Mid

**CROSSWORD**

Solution to Prize Crossword No 13



WINNER of £10 in CW Crossword Competition No 13 is Vincent Gamble, information manager with Rolls-Royce in Derby. Cecil Marks, a founder member of the BCS who recently retired as director of systems training at the Civil Service College, and Mr W. Linton of North London, win £5 each.

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(4684)

**NEXT WEEK  
NORTHERN  
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FEATURE**

Advertisers are reminded that the next Computer Weekly Northern Recruitment Feature will be published on March 5 and will highlight career opportunities in the North.

Space reservations should be made as soon as possible to:

Owen Kelly—Manchester  
061-872 4211  
Julie Hannaford—London  
01-661 0121

Copy Deadline: P.M. Friday before

**COMPUTER WEEKLY**

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**Software Engineer**

Our Telemetry & Automation Section is responsible for the provision of remote control and monitoring systems throughout the IIA's network of television transmitting stations.

We now need a Software Engineer to analyse user needs and software design for systems and equipment covering programme input, transmitting station control and monitoring. The work will also include consulting for the purchase of equipment and software, writing specialist programs and involvement in the specification and commissioning of equipment.

Applicants (male or female) should be qualified to degree level in electrical/electronic engineering or computer science. Several years experience in systems design and applications work in a hardware/software environment is essential. Travelling away from base is required, therefore, a current driving licence is necessary.

Starting salary will be within the range £7,600-£9,600 per annum according to experience. Re-location expenses will be paid, where appropriate.

Application should be made to Professor K. F. Barker from whom further details may be obtained at University Engineering Laboratories, University Walk, Bristol BS8 1TR.

(4685)

**IBA**  
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Please write or telephone for an application form, quoting reference number CW/BS/1c to Glynn Powell, Personnel Officer, IBA, Crayville Court, Winchester, Hampshire, SO21 2QA. Telephone 822270.

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MIDLANDS

BANKING ANALYSTS  
INSURANCE ANALYSTS  
For City and Surrey  
for 8 months to 1 year contracts  
£400 p.w.  
Recruitment Specialists  
OCC Computer Personnel  
11 Hospital Street, Newcastle  
CITY, 0191 227 206

**Senior Operator/  
D.P. Manager  
Designate**

Brantford International Limited, part of the Furness Withy Group, is one of the largest Freight Forwarding Operators in the U.K. and is expanding internationally.

The Company is introducing a new Hardware Installation at their Head Office at Barking, Essex based on the ICL ME 29 generation of equipment and is seeking a Senior Operator/D.P. Manager Designate to assist at the commencement of a new phase in the Company's operations. The successful candidate, probably 30 years plus, will have at least 12 months experience on ICL 2903/04 or similar equipment and will have proven supervisory experience. He/she will be expected to become totally involved in Systems Applications, in addition to the efficient day to day provision of batch/real time facilities, the selection and training of operational staff and liaison on the development and installation of peripheral equipment when desired.

Future prospects for the right applicant are extremely good and the importance of this position within the Company will be reflected in the salary and benefits offered.

Please telephone or write for an application form to Mr. R. Martin, Personnel Manager, Brantford International Limited, Regal House, East Street, Barking, Essex, IG11 8EY. Tel: 01-594 7181 ext. 367.

The job opportunity is based in

**SMR**  
Sales & Marketing Recruiters Ltd  
Victory House, 99 Regent Street, London W1R 7HB  
A Sales and Marketing Services Company  
London & Midlands

**Sales Manager**

A ground-floor opportunity  
at the start of New Venture

For many senior salespeople the reality of advancement into sales management is "dead men's shoes." This is not so much an indictment of company attitudes towards personnel development as it is the scarcity of opportunity and competition for such jobs when they do occur. For many the only real career progress hope is getting in at the beginning of a new business operation and growing with it. This is such an opportunity.

Our client has identified a vertical market, developed a cost-effective realtime computer system, proved it in the field and now has an extremely attractive product which at present has no significant competition.

In order to exploit this situation, our client now wishes to appoint a SALES MANAGER to establish an operation which will initially consist of only himself, but will quickly develop into a sales and marketing team under his complete control. This is likely to appeal to Senior Salespeople with marketing flair and an outstanding record of sales success related to minicomputer systems who wish to advance into a management role.

The job opportunity is based in

**London**

but management responsibility will embrace the entire United Kingdom.  
It is expected that target earnings will be in the region of

**£20,000 + company car**

with a negotiable, non-returnable advance against commission earnings.  
Please contact Alasdair Scott quoting reference SJT/002 on 01-734 9776.

Tel: 01-734 9776

Midlands and North: Leighton 095-316602  
Answering Service after 6pm and weekend  
SALES TRAINING, MARKET RESEARCH, RECRUITMENT

**SALES BIT**

Professional Credibility — 2

**Manners maketh a successful salesman**

of their actions, command a high level of personal respect from their clients in order to secure a continuing business relationship as well as the maintenance of the existing revenues. This can only be achieved by adopting a code of personal behaviour and ethical standards that are constantly beyond reproach.

Dress usually has a significant bearing on individual personality. Certainly the first judgment usually made by a potential buyer is a subjective assessment of the salesperson concerned as a result of the initial impact of personal presentation. Neat and tasteful clothes suggest someone who is reliable and efficient; scruffy or casual dress usually means the opposite. Whether or not the truth is different, inappropriate dress can create an unnecessary initial emotional hurdle.

If the best salesman in the business suddenly took to wearing a jock-strap and bowler-hat he would probably never make another sale; unless, of course, he switched to selling jock-straps and bowler-hats.

People like to know where they stand and have respect for people who make their situation and intentions absolutely clear. It is essential that salespeople quickly establish their reason for calling and their credentials as bona fide representatives of their company. There should never be any doubt that their reason for calling is to sell something and that the opportunity to present the reason for buying is truly appreciated.

That's all for now. Next week will see the conclusion of this piece on professional credibility which will touch on the role that product and applications knowledge plays in this process as well as the effect of the company image, or even lack of it, on the status of the individual sales person.

The buyer needs to believe that the salesman really cares — and if he doesn't he shouldn't be in the job.

Salespeople do business with salespeople who are in any way disrespectful towards them or fail to satisfy the common courtesies of business practice.

Salespeople must, by virtue

Alan Williams

**COURSES****Introduction to systems**

Several training courses are to be held by LMBM over the next few months: Minicomputers, Distributed and Standalone Systems is designed for system designers and managers, and may be useful to non-DP staff familiar with the basics of computing. The course will be in London from March 11-13, and costs £205 + VAT. For further information on these, and other courses, contact the registrar on 01-3475959.

The benefits of word processing will be examined in one-day course in London on March 26. Organised by BIS Applied Systems, the course is aimed at departmental managers and senior DP or O&M staff who need to become familiar with word processing. The course will be in London from March 18-20. A course which aims to provide techniques, documentation and project control, called Project Management and Control will be held in London from March 24-27. The fee is £260 + VAT. For further information on these, and other courses, contact the registrar on 01-3475959.

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**PUZZLE ANSWER**

If there is only one ( $n=1$ ) regional rep, the probability is zero. With  $n=2$ , this probability increases by  $1/2$ , and becomes  $1/2$ . With  $n=3$  the probability decreases by  $1/3$  and is then  $1/3$ . Then,  $n=4$  gives an increase of  $1/4$  up to

a total of  $3/8$ ; and  $n=5$  results in  $1/30$ . So if  $n$  denotes a very large number, we get the series  $1/2 - 1/3! + 1/4! - 1/5! + 1/6! - \dots + (-1)^{n+1}/n!$  The value of  $e^{-1}$  is  $0.367879441$  up to seven decimal places).